THE PAPER INDUSTRY and PAPER WORLD

JANUARY, 1941 — VOLUME 22 — NUMBER 10

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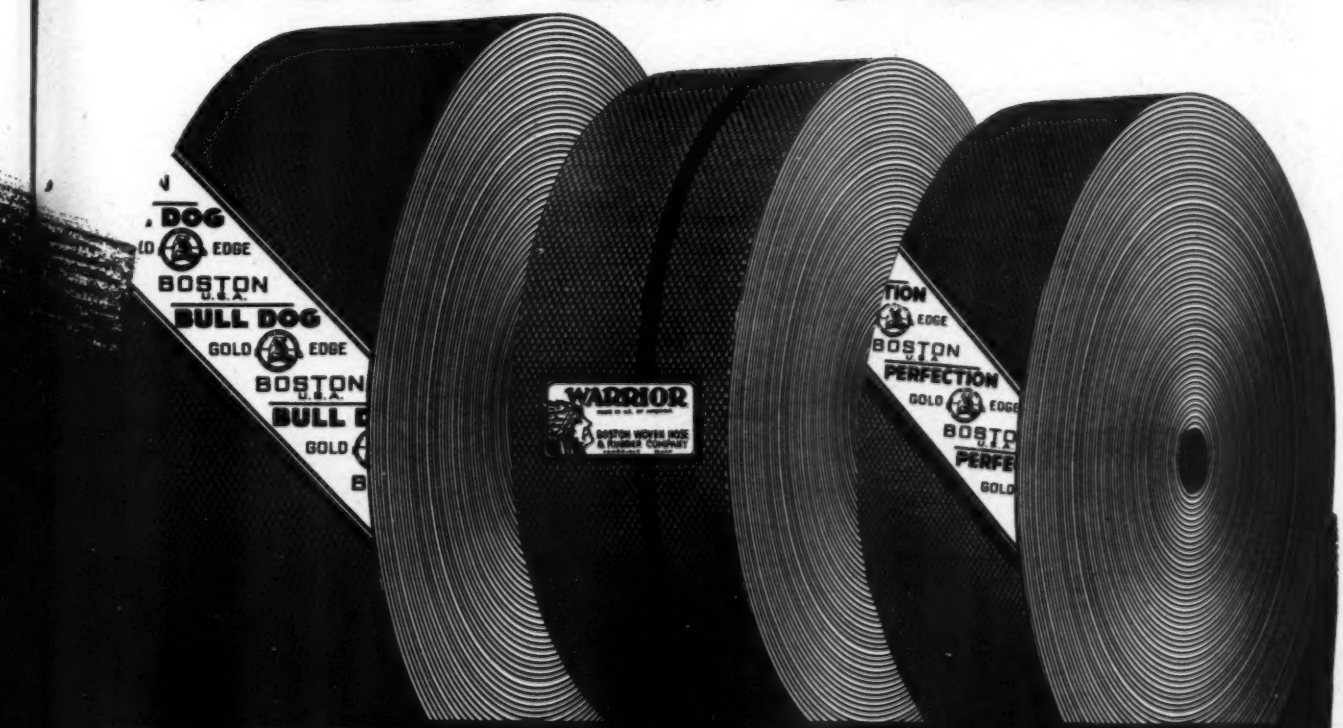

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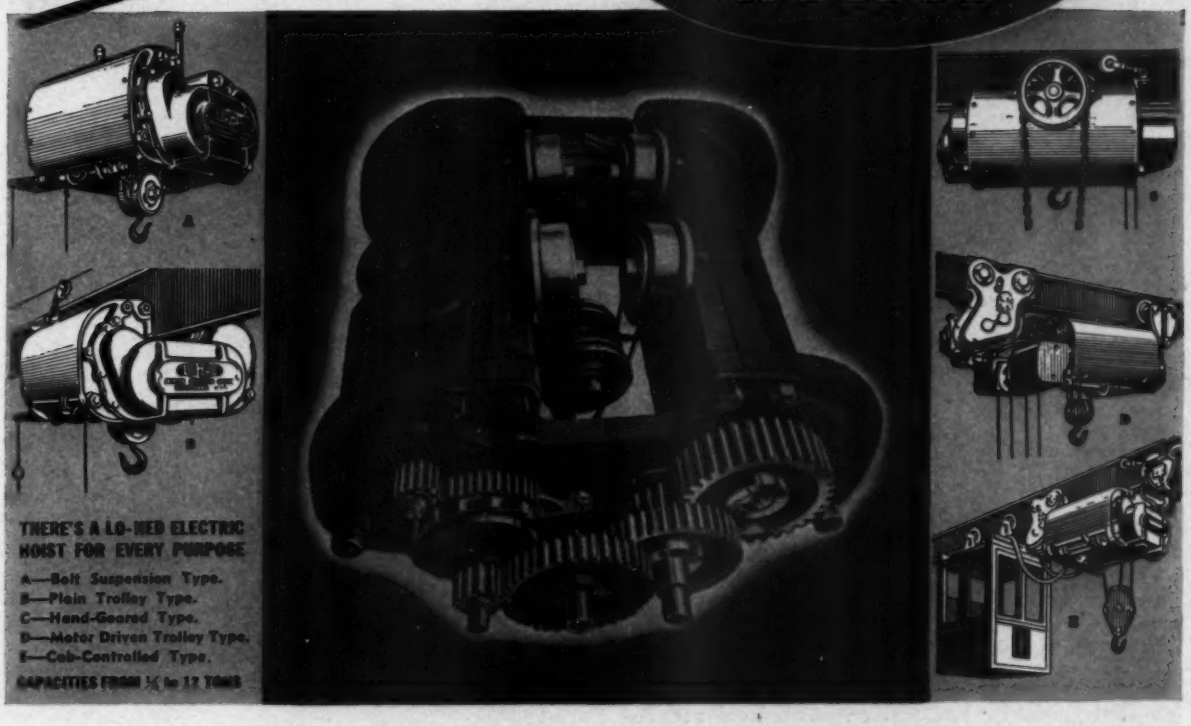
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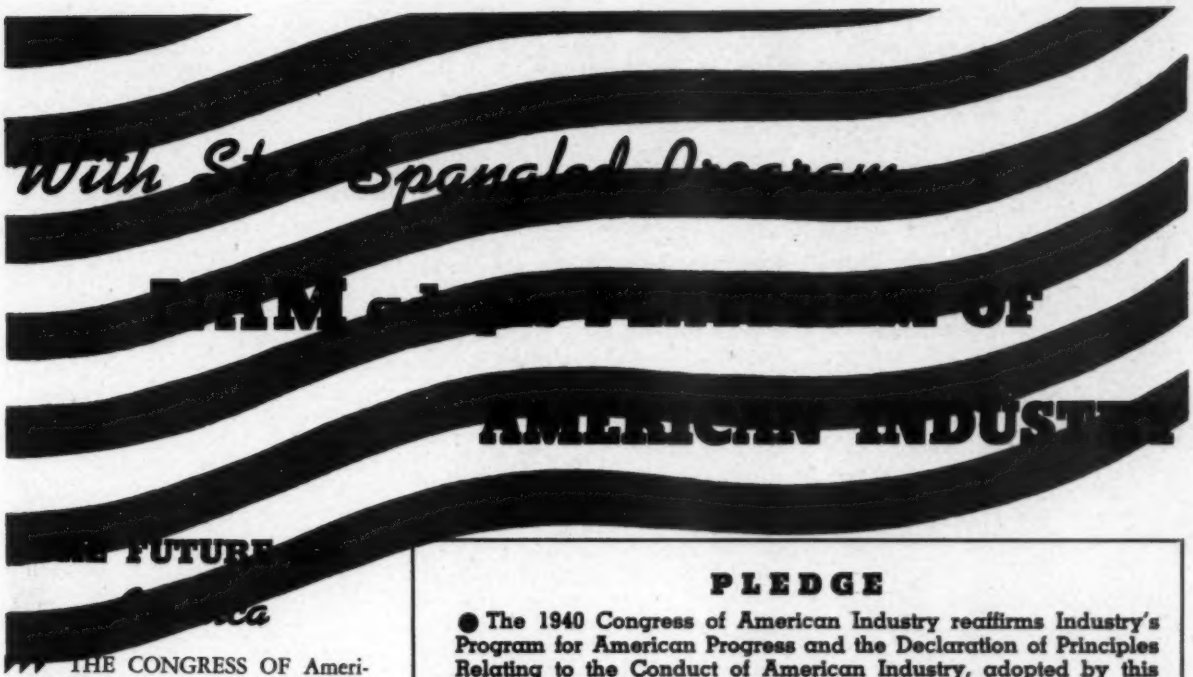
"The Stars and Stripes Forever"

★ Putting the nation's house in order is the uppermost task of today. All industrial activity, public and private enterprise are cooperating to the limit of ability and resources that America may be strong—strong enough to prove to any aggressive forces that "right makes might."

★ American business men are striving to mold the utilization of the country's facilities and man power into this the greatest Defense Program of all peacetime. It is the desire of this magazine to publicize vividly the paper industry's part in this great military movement, and it is hoped the material presented in this issue will be invaluable, and that it will help all who read it to fill a special niche in the army that lives peacefully under the stars and stripes.

The medallion reproduced on this page depicts private enterprise and its indispensability to the American way of life. It was designed by Rene Chambellan, noted American sculptor, and was presented to industrial leaders at the 45th Annual Congress of American Industry (See page 1010).



PLEDGE

● The 1940 Congress of American Industry reaffirms Industry's Program for American Progress and the Declaration of Principles Relating to the Conduct of American Industry, adopted by this Congress in 1938 and in 1939, and further pledges itself:

(1) To continue to defend against attack from any source the American concept of freedom — constitutional representative democracy, private enterprise, and civil and religious liberty, including freedom of speech and freedom of the press.

2) To exert its utmost effort in co-operation with the Government to carry out the program of National Defense with all possible speed and efficiency.

3) To maintain at the same time, as fast as possible, production of goods and services to meet normal needs.

4) To do its full part to prevent or cushion a threatened post-war economic depression, by supporting and following practices which will contribute to the maintenance of a healthy economic life.

5) To continue to promote within industry, recognition and fulfillment of the economic and social responsibilities which industrial management shares with other groups for the improvement and advancement of the general welfare.

● The Congress of American Industry pledges itself to work for the preservation of America's institutions and the protection of America's future.

THE CONGRESS OF American Industry* meets this year profoundly conscious of the dangers which confront the nation in a world torn by war and revolution. The American people in all walks of life—farmer, factory worker, housewife, lawyer, saleswoman, executive, clerk, and shopkeeper—all are deeply concerned as to the future of America; the future of themselves and of their children.

Our country is challenged from abroad, but still at peace. It is perplexed by continuing problems within which must be solved. Our people are united in their purpose to make themselves so strong that their liberties and their way of life may be preserved.

We recognize the vital part that American industry must play in securing the strength and welfare of the nation.

What Is Industry?

Industry, in the broadest sense, is America at work. It is the production of goods and services by millions of men and women working on farms, in mines, in factories, in offices, in shops. It is the American people themselves who make industry. They provide the capital; they furnish the labor; they consume the output.

Industry's Responsibility

Well-supported churches, well-equipped schools, comfortable homes, busy stores and offices, all depend upon busy farms, mines, and factories. The people, in order to maintain their standard of living, want the goods and services that industry can produce. But today they are demanding, in addition, the goods and services with which to build defenses so strong that the nation will be safe against foreign aggression.

It is upon industry that the people must depend if the goods and services for both of these purposes are to be produced: it is to the free enterprise system that the people must look if the nation's defenses are to be provided in a manner which will preserve, and not destroy, the way of life they are designed to defend.

The Task Ahead

The task before us in America is twofold: first, *to safeguard our freedom,* by providing our military defenses, by strengthening our economic defenses, by fortifying our moral and spiritual defenses; and, second, *to prepare for the future,* in both its immediate and long-range aspects.

Safeguarding Our Freedom

What We Need to Protect

We Americans intend to remain a free nation of free men and women.

(*) This platform was adopted by the National Association of Manufacturers at the 45th Annual Congress of American Industry held in New York City December 12, 1940.

We have faith in constitutional representative democracy, in private enterprise, and in civil and religious liberty as the inseparable fundamentals of our freedom.

Freedom, as we Americans know it, means that we may attend any church we prefer; elect our government representatives in free elections; say and write, hear and read what we please; live and work where we will; invest our savings in a home, in a neighborhood shop, in a corporate enterprise, or however else we choose. Such liberties as these are the most precious heritage of every American.

To safeguard our independence as a nation we must build our military, economic, and spiritual defenses on a foundation of strong and united purpose; but in building these defenses we must hold fast to the liberties that are the very foundation of the American way of life.

Providing Our Military Defenses

The strength to defend America is the first concern of this nation. Three major problems are involved:

1) To determine the vital interests to be defended and how far beyond our continental borders these interests extend. This is the responsibility of Government.

2) To determine the nature and size of the military establishment, and the equipment and supplies required. This also is the responsibility of Government.

3) To produce the required equipment and supplies. This is the task of industry—of America at work.

Production of the equipment and supplies required for defense has been entrusted to the individual industrial enterprises of America, whose productive ability is demonstrated by the fact that this is the greatest of industrial nations.

The manufacture of planes, warships, guns, and many other kinds of munitions and equipment has created a demand for new machinery, new tools, and new skills, to which the individual industrial enterprises of America are applying their full initiative and resourcefulness.

American industry is undertaking its task.

Strengthening Our Economic Defenses

Our economic machine must be geared to the production of both the equipment needed for National Defense and the goods needed for everyday living.

For several years prior to the outbreak of war in Europe, the totalitarian countries had been using a large part of their resources for armament purposes. Confronted with the necessity of increasing even further their production of war materials, they were forced to restrict still more drastically the production of goods entering into their standards of living.

In this country, in contrast, we start our armament production for National Defense with ample natural resources, with unemployed but employable men, with an expansible plant capacity, and with idle capital, all of which can be put to use not only to make the nation secure against external dangers but also to work at the task of producing the goods and services needed for normal living conditions.

National Defense is national insurance. The American people can secure this necessary insurance without experiencing a reduction in their standard of living to the extent suffered abroad. But the effort to maintain the American living standard at its present level can hold hope of success only if labor, capital and management work together with a united purpose for production.

Among the fundamental conditions necessary to this end are the following:

1) An equitable relationship between the prices of agricultural products and the prices of other commodities.

2) Opportunity for industrial management and labor to operate efficiently and effectively in the processes of production and distribution.

3) Taxation carefully and intelligently adjusted to meet at least non-defense expenditures, and designed to facilitate the flow of private capital and remove uneconomic barriers to the production and distribution of needed goods and services.

4) Avoidance of production by Government of goods which private enterprise can furnish.

5) Recognition of the value of the profit motive as a powerful incentive to productive effort, and of the economic need for profits in industry sufficient to maintain and expand productive enterprise.

6) Maintenance of such equitable wage rates and conditions of employment as will promote increased production and employment and a higher actual income to workers.

7) Encouragement of the investment of private capital in production, research, and continued economic venture.

8) Preservation of competition as the best assurance to the consumer of reasonable prices and high and improving quality of product.

9) Maintenance of the buying power of consumers by all possible improvements and economies which will reduce costs of production and distribution.

Healthy industry is as essential to the production of adequate military equipment and to the maintenance of the American standard of living as are healthy men to an efficient army and navy.

Fortifying Our Moral and Spiritual Defenses

Essential to America's defense effort is the moral and spiritual strength of the people. There must be a resurgence of faith in God and country, of confidence in each other and in ourselves; there must be self-reliance and a willingness to sacrifice immediate self-interest for the common welfare. These have been outstanding American qualities in all our history.

Where dictators rule, they have tried to create national pride and zeal and to induce united action in their peoples by absolute control of sources of information, prevention of free discussion, and suppression of civil liberties. These are means that would never be tolerated in the United States.

In the free society which this nation is arming to defend we can in our American way strengthen the moral and spiritual vigor, the purposeful unity, that have carried us through other crises and are needed now more than ever.

The American people are awaking to a common appreciation of what they have to defend, stirred to a common zeal for defending it, inspired with a common patriotic devotion. We are all ready to travel the hard road, if need be, to assure the continuance of the American way of life.

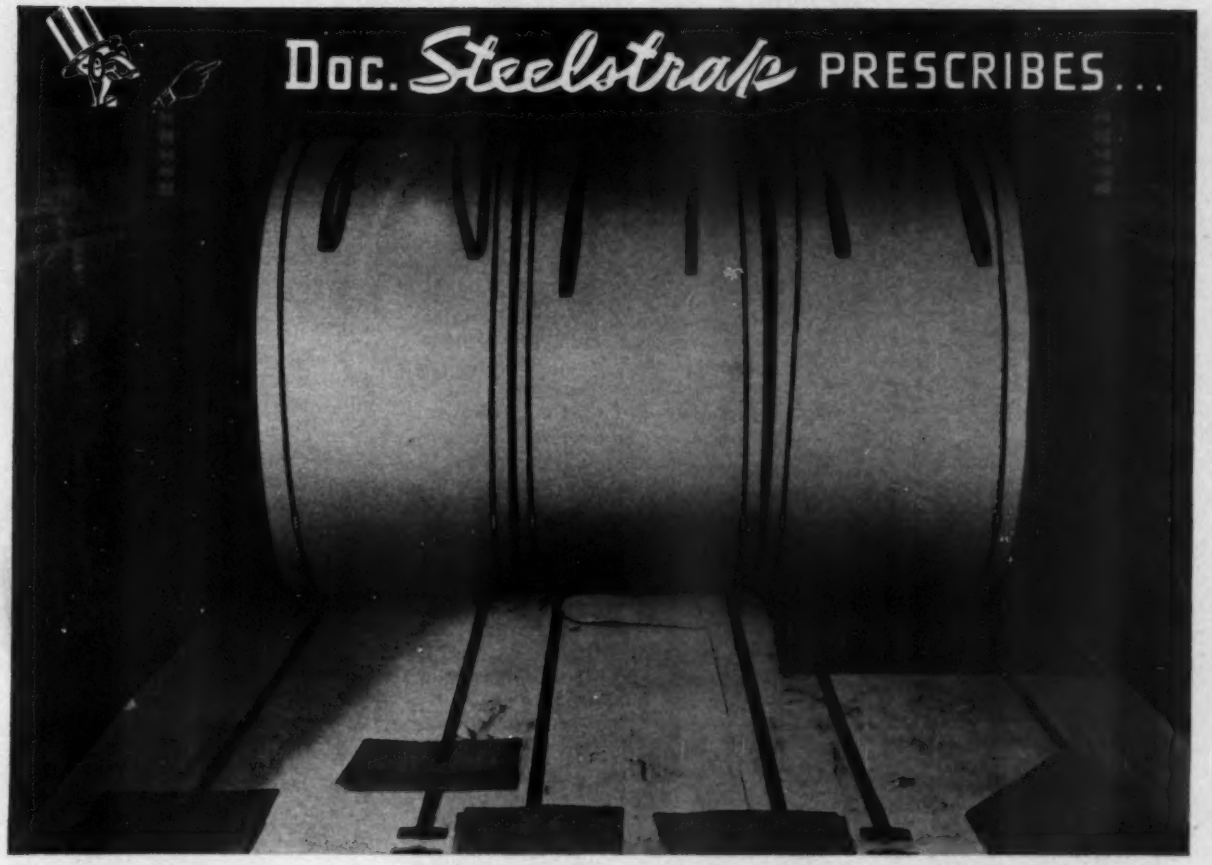
Preparing for the Future

In preparing for National Defense and while endeavoring to maintain normal economic life, the American people are concerned also with what lies farther ahead.

When Peace Comes

The time will come when millions of workers engaged in producing goods for National Defense will be released from that employment; when a large army of young men will have completed their military training; when the support provided by the defense program to employment in non-defense occupations will cease. In other countries similar conditions will exist, the effects of which upon this nation's domestic and foreign markets should be anticipated.

Consistent with the maximum defense effort itself, the policies and practices followed during the existing emergency by business, labor, agriculture, and government should be such as to lessen the dangers of a post-war



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depression or cushion the effects if one should occur.

Among such fundamental considerations are protection of government credit, by keeping reserves of borrowing power for future use if needed, and by encouraging the use of private funds for productive defense facilities; prevention of an inflationary spiral of runaway prices and wages; curtailment by industry of any tendency to over-mortgage the future or to build up inventories unnecessarily, by unwise expansion of credit through installment selling or otherwise; efficient expenditure of defense funds; and rigid economy in non-defense expenditures of federal, state and local governments.

Such measures would not delay or obstruct armament production; yet they would contribute much to preventing a subsequent economic depression.

The Longer View

America has been built to its present stature by the free enterprise and individual initiative of its people.

Fifty years ago our geographic frontiers had disappeared. We found that new industrial frontiers offered opportunity for even greater expansion. There are other industrial frontiers before us today still more extensive, still more promising.

Here in America we have an abundance of natural resources, of manpower, of machines, of capital, of organizing and technical skill.

Inventors' workshops and research laboratories are constantly supplying new things that create new jobs and contribute to a higher standard of living as they are developed into commercial products.

The main assurance of the future welfare of America lies in the present and potential wants of the people and in the ability of free enterprise to provide the goods and services the people desire.

Today and for the future, the American people want strength and security, built upon the freedom of individual opportunity. It is this freedom of opportunity that has served America so well in the past; that can make the nation strong and secure in the existing crisis; that can bring security to the individual in the years ahead, in such measure as his individual effort can achieve.

Our heritage and our vision is a free, happy, industrious America—a vital, dynamic America of self-reliant individuals. It is a heritage which Americans acting together can preserve and enlarge. It is a vision which Americans working together can realize and fulfill.

FORTY-FIFTH CONGRESS OF AMERICAN INDUSTRY

▶▶▶ WHEN THE 45TH CONGRESS of American Industry adjourned the evening of December 13, there came to a close what was undoubtedly one of the most significant and important American conventions held since hostilities began in Europe. The three-day meeting, highlighted with numerous addresses by national figures, was sponsored by the National Association of Manufacturers and hence the United States was able to hear for the first time the official expressions of the men who are stars in the drama of America's defense.

Outstanding as the theme of this meeting to most was the direct, level-headed approach of the NAM to the vitally important problem of National Defense. This was, perhaps, presented most concisely by the president of the NAM, H. W. Prentis, Jr., who, while advocating the speedy production of armaments as the first task in providing military defense, asserted that the United States "must be on guard constantly lest we be left ultimately with only the empty shell of what we are now arming to defend."

This thought seemed to be carried out throughout the whole convention and was heralded by NAM members as a concrete indication to the general public that while, of course, most of the immediate actions of industry will be to arm this country speedily, industry will not forget that the fundamental issues behind National Defense are to protect our liberties and freedom—to arm for the present and to prepare for the future.

The Congress of American Industry was held at the Waldorf-Astoria, New York City, December 11-13, and was divided into five principal parts: (1) The Need for Total Preparedness, (2) Production Aspects of Preparedness, (3) Economic Aspects of Preparedness, (4) Intellectual and Spiritual Defenses and (5) Post War Readjustments.

It is, of course, impossible for THE PAPER INDUSTRY AND PAPER WORLD to reproduce in their entirety, the addresses made by speakers at the NAM Convention. Highlights of all the available speeches are reproduced on the following pages. The complete titles of the addresses, the name and identity of the speakers are shown below:

Total Preparedness for America's Future (Keynote Address)—H. W. Prentis, Jr., president, National Association of Manufacturers and of the Armstrong Cork Company.

The World Background — Anne O'Hare McCormick, foreign affairs analyst, *New York Times.*

Financing the Defense Program—John W. Hanes, chairman, executive committee, United States Lines.

The National Background—General Hugh S. Johnson, columnist, commentator.

Wages and Hours and National Defense—Colonel Philip B. Fleming, administrator, Wages and Hours Division, Department of Labor.

The Problem of the Supply of Labor—Clifford Stilwell, vice president, Warner & Swasey Company.

Conciliation—John R. Steelman, Director of Conciliation, Department of Labor.

The Problem of Federal Labor Laws—W. M. Angle, president, Stromberg-Carlson Company and chairman N.A.M. Employment Relations Committee.

Sabotage and the Fifth Column—J. Edgar Hoover, director, Federal Bureau of Investigation.

The Lesson of France—Andre Maurois, French author attached as official observer to the British Expeditionary Force.

Preserving the Private Enterprise System—J. Howard Pew, vice president of the NAM and president, Sun Oil Company.

Economic Pitfalls of Totalitarianism—Carl Snyder, author, and former president of the American Statistical Society.

Internal Prosperity Essential for External Defense—Philip D. Reed, NAM director and chairman of the board, General Electric Company.

Explaining the Private Enterprise System—F. C. Crawford, president, Thompson Products, Inc.

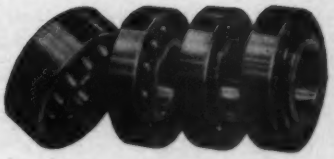
Public Opinion Now—W. B. Weisenberger, executive vice president, NAM.

Industry Speak Up!—C. M. Chester, chairman, N.I.I.C. and chairman, General Foods Corporation.

The Religious Foundation of True Americanism—James W. Fifield, First Congregational Church, Los Angeles.

The Battle of Bureaucracy—James A. Emery, General Counsel, NAM.

What Should Be Our Policy in the Present European War?—General Robert E. Wood, director, NAM, chairman, Sears, Roebuck and Company.



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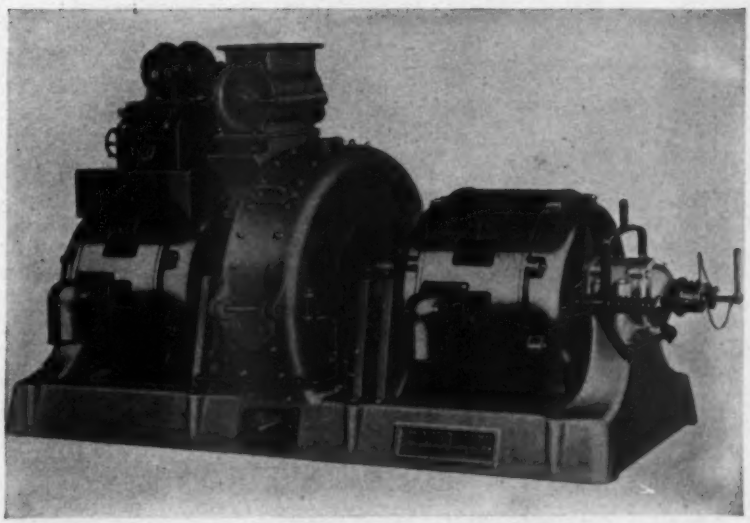

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That the bearings are SKF is a tribute to their practical design . . . to the special, through-hardened steel of which they are made . . . to the high degree of skill that goes into their manufacture. Then, too, they bring about savings in power, maintenance, and lubrication that shouldn't be overlooked. You can get the same thing if you send your bearing problems to SKF.

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Permanent Defense — William Mather Lewis, president, Lafayette College.

When Peace Comes—Wythe Williams, commentator, editor of the *Greenwich Time*.

Post-War Readjustments—Malcom Muir, chairman, NAM Committee on Study of Depressions and president, *Newsweek*.

The World Ahead—Charles Kettering, vice president in charge of research, General Motors Corporation.

An Address — Will Durant, philosopher.

Industry Meets the Challenge of Defense—William Knudsen, Advisory Commission to the Council of National Defense.

H. W. Prentis, Jr.

"One principle that stands fully revealed in the light of the past is that ideas always dominate physical facts and in the long run determine the course of our existence . . . "

"So as we consider the need for total preparedness in America today, we must look behind as well as ahead . . ."

"man must pay a definite price—a serious price—for the spiritual and intellectual satisfactions of self-government . . . "

"control of a nation's economic affairs by public authority inevitably leads to the destruction of personal freedom . . . "

"Industry knows, too, that modern war presents a basic threat to representative self-government appalling to contemplate, for modern war is not primarily warfare between men; it is the combat of iron men; of machines on a mass production basis . . . "

"industry is deeply concerned, moreover, about the lack of co-ordination, the lack of delegated authority, the lack of long-range planning, which is not only essential to defense but also urgently needed to guard against the inevitable aftermath of the present armament boom. . . . "

Anne O'Hare McCormick

"Industry has forged ahead so fast that it has not looked around to observe the consequences of its own motion. It has been so intent on its own progress that it has not picked up the pieces of the mold it has broken . . . "

"Today the challenge for America and particularly for this Association, which represents productive power and its ever-changing speeds and methods, is the strange and terrifying face of the world around us. . . . "

Hon. John W. Hanes

"It may not be possible that we all think alike on this matter, but one thing is absolutely essential and that is a complete tolerance for the other fellow's viewpoint . . . "

"Another boom is something that this country should avoid . . . "

"The challenge facing our country calls for work, and more work, production and more production . . . "

"How much we can pay on the cost of defense next year is dependent in a very vital way upon how much will be the normal cost of government next year . . . "

"In this crisis it is not asking too much of the government to insist that all unnecessary items in the federal budget be eliminated . . . "

"National unity does not mean to me, supine agreement to every proposal, nor to every issue that might be controversial. It means discussion, argument and debate that will help us develop our real situation—our risks, our dangers, our safety. . . . "

General Hugh S. Johnson

"For the peace of America and the future of our country depends, in this phase, on just one thing—the efficiency of the greatest defensive force the world has ever known—the devotion, speed and production of American industry, organized and mobilized for war . . . "

"I deny that the best way, or even a practicable way, to get this great American industrial machine into its highest gear and fullest speed—is governmental compulsion and totalitarian domination . . . "

"You can't undertake a priorities system—a management of shortages—without having some control of price, if we are to avoid the worst curse of war—inflation . . . "

"To our country I can say on the basis of intense experience that American industry is now our chief reliance for defense. . . . "

Colonel Philip B. Fleming

"You know and I know that any competition on efficiency will not only be met but be licked by American manufacturers and American workingmen . . . "

"The most valuable and powerful of our resources is getting into action—the manpower of our 150 millions . . ."

"The 40-hour week is working. Reports coming to my office indicate that it's causing plant after plant to go on two and three-shift operation; that it is hastening the employment of hundreds in good-sized plants down to the employment of one or two in the very smallest establishments. . . . "

Clifford S. Stilwell

"Germany's figures supply ample evidence that modern war is primarily a war of supporting industry . . . "

"One of the tragic realizations of our current experience is that of the losses which industry has suffered by failing to enlarge or even to sustain the policy of long-term apprentice training both to offset the dislocations incident to the depression years and to balance the normal mortality of men in industry . . . "

"The foreman of the future, and desirably, the foreman of the present, must function in a broader scope. He must be selected largely on the basis of his character, mentality and leadership, which are fully as important as his skill and energy as a mechanic . . . "

"I am convinced that fundamentally one of our greatest weaknesses at the moment lies in a lack of sufficient trained supervision and in the difficulty of rapidly enlarging this important group . . . "

"There is no question of the ability of American industry to protect our American way of life. . . . "

John R. Steelman

"We Americans have long been committed to a system of voluntary, democratic readjustment of the problems arising from the relations of labor and management . . . "

"It is our policy to keep both the Defense Advisory Commission and the War and Navy Department closely and constantly informed of the status and progress of every situation which involves the defense program . . . "

"You cannot legislate peace. You cannot prescribe harmony. You cannot decree co-operation.

"What is needed is a more positive concept of industrial peace. Any peace worth the name embraces far more than the mere absence of surface manifestations of strife.

"It is for us, free management and free labor, to demonstrate that freedom and efficiency are not incompatible—that, rather, the highest efficiency depends on freedom. . . . "

Andre Maurois

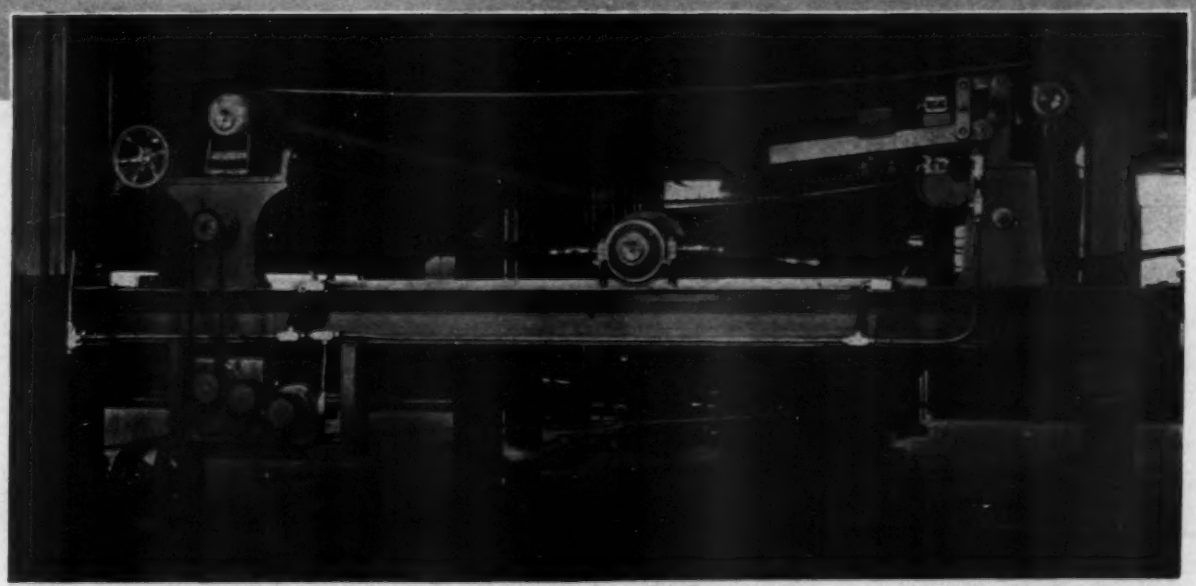
"Your problems are in many ways similar to those of France a few months ago. Your political institutions are very nearly what ours were before this war. You defend a life which was our way of life . . . "

"No government of the people is possible if the people are not told the truth . . . "

"in war, as in all forms of action, time is the all important factor . . . "

"A program of rearmament is nothing without a time table . . . "

. . . now automatic dryer felt tightening is available for new or old machines . . .



Shown above is an installation view of the improved automatic Dryer Felt Tightener (Trempe patent) introduced by Puseyjones.

HERE'S an end to curled and cockled paper resulting from dryer felt irregularities. After seven years of test installations, Puseyjones introduces a tensioning apparatus for improving paper in the drying—the automatic Dryer Felt Tightener.

The automatic Dryer Felt Tightener maintains uniform pre-set tension of the dryer felt to the dryer surface without any attention on the part of the operator. Eliminates tight or loose felts. Easier on felt seams. Eliminates all hanging weights. Holds the paper firmly against the dryer surface . . . at all times, under all conditions. Increases dryer felt life by eliminating strains. Reduces friction on felt carrying rolls and bearings.

The Automatic Dryer Felt Tightener is available for new or old machines. It is now in operation in some of America's greatest mills. Write us for further facts.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-making Machinery. Wilmington, Del.

"all we can do is tell our American friends: 'Remember what happened to us. Do not wait. Organize your defense in time. You are in a better position to do it than we were, because you are a more united nation' . . ."

"Envy and Fear are both members of the fifth column in any country. . . ."

J. Howard Pew

"Just when this country is struggling with a serious economic depression, we have forced upon us a program of national defense; and so it is time for straight thinking and courageous action . . ."

"Our American system of free enterprise is far more than just a way of doing business. It is a system which at its best comprehends good sportsmanship; produces an ever-improving standard of living; develops initiative, character and discipline; and in many ways goes far toward improving morale and bettering the lives of our people . . ."

"For a democratic government to destroy free enterprise, is for that government to destroy itself . . ."

"Men who occupy places of high responsibility in the administration of this system must always bear in mind that it has not come as a divine right. . . ."

Dr. Carl Snyder

"It is therefore clear that, the high industrial development of the United States, our incomparable mechanical organization and the genius this country has displayed in seizing upon new inventions and processes and developing them to the highest pitch, is no bar to attempts at totalitarianism in this country. And, indeed, this is, in reality, what we have been having now for well over seven years . . ."

"The evil of totalitarianism, as I see it, is the complete abolition of economic freedom and the free private enterprise system—the system which has provided us Americans with the greatest wealth per capita, the greatest material progress of any nation and the highest standard of living in the history of the world . . ."

"genius in politics seems wholly incompatible with genius for enterprise. . . ."

Philip D. Reed

"Whatever else we have learned during the years about forms and theories of government, we know definitely that any government, democratic, totalitarian, communistic or otherwise, cannot long survive a backward trend in the economic condition and standard of living of its people . . ."

"though fine and idealistic in concept, the socialistic form of government under which all property is the property of all and all endeavor is for the benefit of all, has invariably failed. And I suspect that so long as we humans are what we are, it always will . . ."

"A defense that is worthy of the name must look to and protect against internal disorders just as carefully and thoroughly as it prepares to repulse the aggressor . . ."

"Of what use is a spear and a suit of armor to a knight with an ailing heart . . ."

"The elements are with us that make for inflation and war-time boom in prices. Government and industry alike are determined that this shall not occur. It can be prevented without government compulsion if, and only if, every company, every industry, and every organized group in the country will firmly embrace and accept the principle that prices and wages shall not be advanced arbitrarily to take advantage of the situation created by defense activity. For if either moves upward significantly, the other must of necessity follow. . . ."

Rev. James W. Fifield

"Organized religion must come to grips with the freedom-destroying virus of state domination . . ."

"Everyone who believes in God should oppose state domination . . ."

"Physical armaments cannot prevent collapse but spiritual power could. For the world's malady, religionists would prescribe a spiritual crusade. . . ."

James A. Emery

"The making of public policy in the domestic field is neither an executive nor a judicial function. It is legislative. Thus Federal administrative law is born in the Congress. Its use is as old and as necessary as our form of government. But its luxuriant expression in a multiplicity of regulatory bodies is a characteristic of the past quarter century . . ."

"The more general the standard of regulatory action, the more delicate the field of action and the social or business policy to which it is directed and the more serious the effect of administrative action, the more surely the power exercised is open to abuse either personal or political . . ."

"Here in the last citadel of civil liberty, under representative institutions, there is no place for personal government masquerading as the 'law of the land'. . . ."

William M. Lewis

"It is likely that the present emergency will revive faith in our American way of life and enthusiasm for its preservation and development. The universities must take the lead in this resurgence of conviction which alone can give the nation a unifying force . . ."

"Moral strength is needed more than ever before because certain nations are deliberately immoral. Lying is an accepted part of the diplomatic technique of totalitarian nations . . ."

"We have spent too much time preparing our pupils to enter the next higher grade or institution and in the process have neglected the preparation for life. . . ."

Malcom Muir

"All are agreed that defense is America's first problem, let the cost be any sacrifice short of liberty itself . . ."

"If depression is to be expected or even feared, preparation should be made to save the American people from its worst effects . . ."

"There is even greater probability that the defense program now under way and contemplated will have far-reaching economic effects . . ."

"While the nation unites to back industry's task of building a sufficient physical defense, America must defend herself against the results of a false prosperity . . ."

"All thoughtful students of the subject are agreed that prosperity based only on the building of armaments is a false prosperity. Armaments and war are parasitic growths on our economy. Orchid-like they are not self-sustaining . . ."

"A cost we must pay is another bout of 'high cost of living' hysteria that the country suffered twenty-five years ago. . . ."

Charles Kettering

"the manufacturer who does the best job is the manufacturer who endows the material which he sends up and which he sends out across the markets of the country with most of that intangible thing . . ."

"there is, in the great correlation of industry, just as high a degree of artistry in the operation of a plant as there is in the conducting of an orchestra . . ."

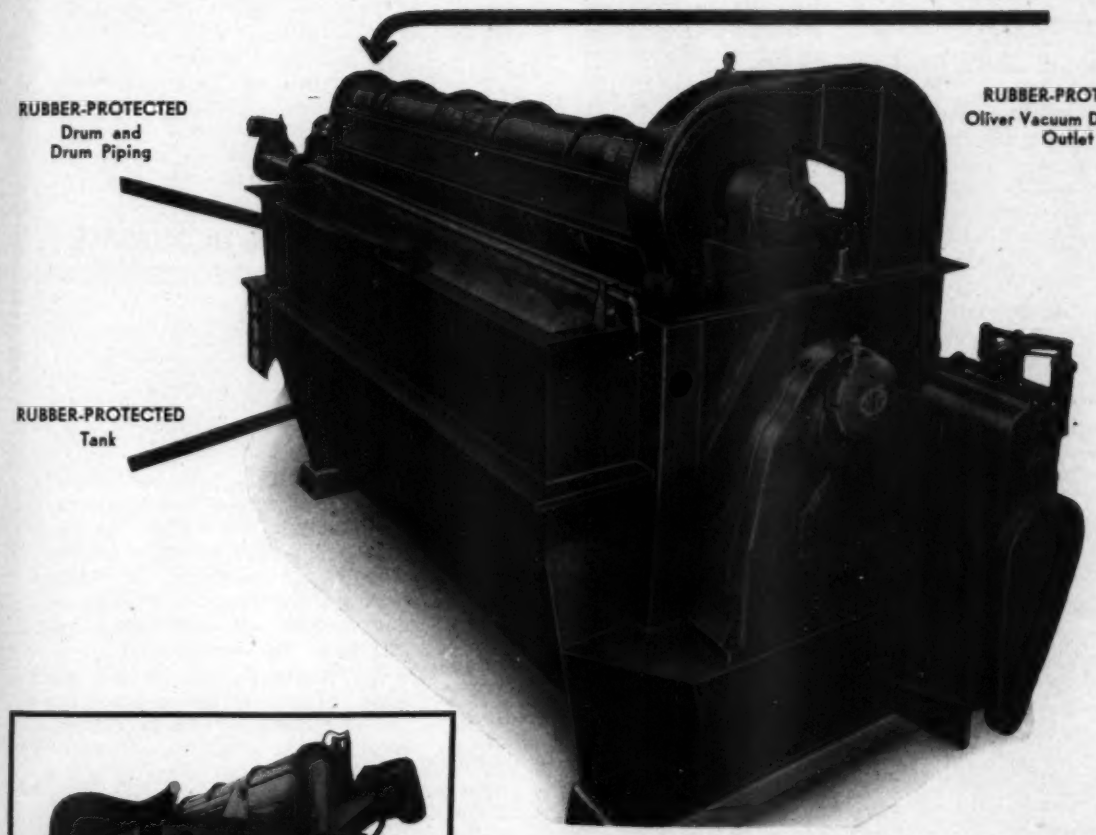
"We have excesses of men, material and money and I should judge from what I have heard today—there might be an indication of excess of debt . . ."

"This war will disappear, other wars will have disappeared, and out of the thing has been a continual upbuilding of the things that the world will provide for them . . ."

"we might as well make up our minds that we are going to study what the future holds for us in an intelligent

THE OLIVER *Long Life* SAVEALL

RUBBER-PROTECTED — METAL CONSTRUCTION



Need more be said? Combine this Rubber-Protection with the experience gained with some 300 Oliver United Savealls and you have a Saveall that will not only work to your satisfaction but last for years.

Keep in mind, too, that this Saveall has the well-developed and thoroughly proved Oliver Vacuum Discharger, so effective in handling thin sheets.

This filter answers your need for a real corrosion-resisting, rubber-protected metal Saveall with highest operating efficiency. Keep in mind that we have been building rubber-protected filters for the paper industry for over six years.

OLIVER

way, because you can do something with the future. . . ."

Wythe Williams

"But never since the beginning of history has the writing on the wall been clearer than in the years preceding the outbreak of the present war. The governments of Mr. Ramsay MacDonald and of Lord Baldwin in England were well aware that Germany was breaking every rule laid down in the Treaty of Versailles and their ordinary common sense told them what to expect . . ."

"War is the most illogical thing on this planet, yet it exists . . ."

"With our tremendous background of history, the peace that follows the present war, this most terrible of all wars, must be a final and lasting peace. It must be either that, or we now stand at Armageddon . . ."

"The old order is indeed changing for the worse today, perhaps for the better tomorrow, but however that may be, this world as we have known it is no more . . ."

"The old world, whatever the outcome of the present war, has long passed its zenith of splendor and already is in the long twilight. As I have both written and said before, the first place in the sun is again thrown open to the United States of America. . . ."

C. M. Chester

"Our task from the outset has been to save free enterprise. Our task has been to prove what America has always known in its deep folk-mind to be true—that a free economy is the base and bulwark of all the freedoms which the common people demanded to be defined in the United States Constitution's Bill of Rights.

"What the people want is definition. Facts and figures and blueprints, an argument as obviously truthful as the hole-proof pattern of two-plus-two-make-four, and as simple as A. B. C., and as dependable as the multiplication table.

"Give America that, in human terms it can trust, and it will have no time for unsound principles and purple promises . . ."

"Industry's defense of private enterprise today is the defense of all the American freedoms. . . ."

◆

▶▶▶ NEW PRESIDENT OF THE National Association of Manufacturers is *Walter D. Fuller,* president of the Curtis Publishing Company, who has had broad experience in civic work. With Mr. Fuller as the new NAM president it is expected that the Association's educational program will increase the momentum picked up under Retiring President Prentis.

◆

▶▶▶ CHAIRMANSHIP OF the NAM's Committee on National Defense and Industrial Mobilization has been accepted by *William Porter Witherow,* Pittsburgh steel manufacturer and president of the Blaw-Knox Company. It was announced that every manufacturing group is to be represented in the new committee's membership.

◆

AMERICAN WAY OF LIFE SHOWN IN MEDALLION

The illustrations on the Theme Page of this issue (page 1000) typify all that makes a people free. These illustrations picture a medallion done to commemorate the 1940 campaign of the National Association of Manufacturers to further understanding of private enterprise and its indispensability to the American way of life. This medallion was especially designed for presentation at the 45th Annual Congress of American Industry meeting in New York last month.

The work of Rene Chambellan, noted American sculptor, and executed by the Medallic Art Company, copies of the medallion were distributed to industrial leaders attending the opening of the Congress.

On the obverse face of the medallion is shown the structure of freedom—a tripod supported by the three shafts of representative democracy, civil and religious liberty, and free private enterprise. Beneath are figures symbolic of workers, agriculturists, women, children—all of those who share the blessings of this freedom.

On the reverse face, these three great institutions of our freedom are depicted in the material things of our lives. Representative democracy is symbolized by the Capitol dome and a ballot box; civil and religious liberty by the school, church, printing press and the free assembly of citizens; and, finally, man's right to search, to build, to invent, to work as he pleases, symbolized in the smoke plumes of industry.

◆

DEFENSE PROGRAM HELPS HEMP IND.

Defense orders have given the Wisconsin hemp industry a boost which will result in a greatly increased acreage the coming season. Most of the 1940 crop was bought by the United States government, chiefly for rope used by the navy, and mill owners anticipate an increasing demand in 1941.

About 80 per cent of the nation's hemp is grown in Dodge and Fond du Lac counties in Wisconsin. Mills are located at Brandon, Beaver Dam, Markesan and Juneau. Established 25 years ago, the mill at Brandon is today the largest of its kind in the United States.

Wisconsin has become the hemp center of the nation chiefly because of the University of Wisconsin's willingness to co-operate in solving technical problems confronting the industry in its early days.

◆

G-E EXECUTIVE URGES INDUSTRY TO MODERNIZE

Post-war business needs as well as national defense require modernization of American industrial plants, Earl O. Shreve, vice president of the General Electric Company told members of the St. Louis Electrical Board of Trade in an address on December 10.

"In 1932, about fifty per cent of the plant equipment in this country was over ten years old," said Mr. Shreve. "By 1939 it is estimated that about 70 per cent of the plant equipment was over ten years old. Our industrial plants are handicapped by a backlog of obsolete machinery."

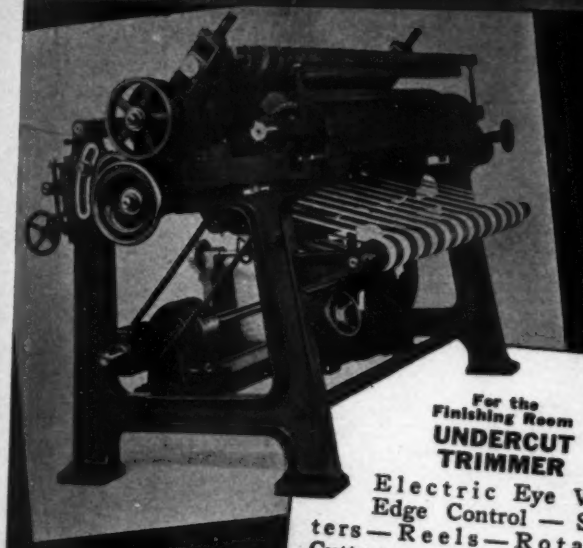
Mr. Shreve pointed out that the nation must modernize present plants as well as build new ones to fulfill the obligations in producing armaments. He also warned that when the war is over, no matter who wins, this country will be faced with competition from comparative low cost labor and modern equipment.

◆

NEW PULPWOOD TAX IN QUEBEC

An order imposing a levy of 10 cents a cord on all wood cut within the timber limits of Quebec Province and manufactured in pulp and paper whether in or outside Quebec, has been issued by the Quebec Government. This levy applies to cutting operations in the 1941 season. The tax, which is expected to net the province over $200,000 was applied for the purpose of providing a fund for training engineers, technicians, and workmen for exploitation and development of the province's forest resources and other natural resources.

SINCE 1828 - FINER PAPER MILL MACHINES



PAPER MILL MACHINERY

Straight, Harper and Edwards Fourdriniers—For book, bond or fine tissues.

Cylinder and Wet Machines. Jordans — Pumps — Calenders "Rainstorm Shower Pipes".

●

Below: THREE PLUNGER STUFF PUMP

For the Finishing Room

UNDERCUT TRIMMER

Electric Eye Web Edge Control — Slitters — Reels — Rotary Cutters.

●

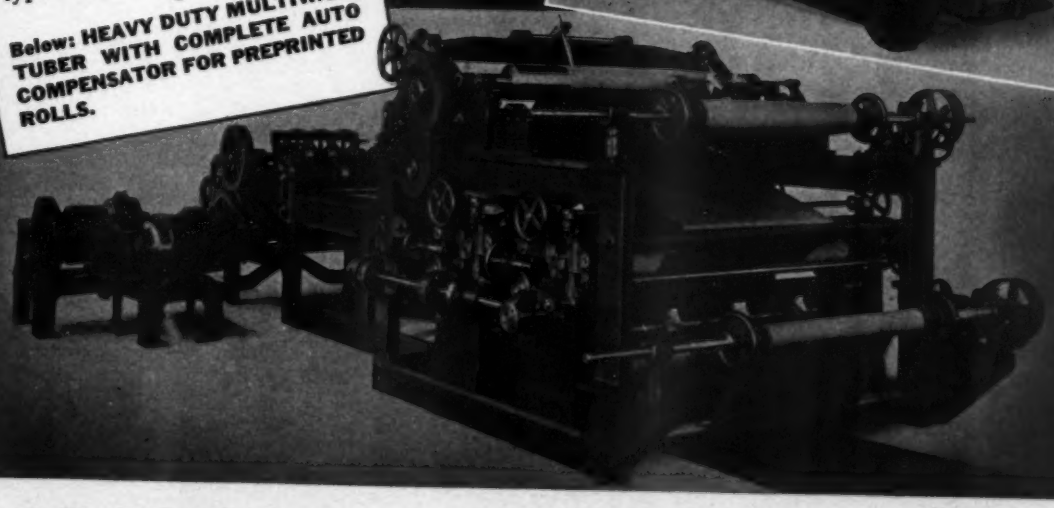
Above: Rotary SPOT CUTTER

FOR BAG PLANTS

Flat, square and satchell bottom bag machines—single and multiwall pasted valve bag machines — tuber and bottomer type bag conveyors.

●

Below: HEAVY DUTY MULTIWALL TUBER WITH COMPLETE AUTO COMPENSATOR FOR PREPRINTED ROLLS.



The SMITH & WINCHESTER

Manufacturing 1828 *Company*

PLANT AND OFFICES AT SOUTH WINDHAM, CONNECTICUT

A BIRD'S-EYE VIEW OF

A plane from the Pensacola Navy Training School flies over the site of the new plant of Florida Pulp and Paper Company.

▶▶▶ ANOTHER VOLUME in the industrial record of the South is being formulated with the construction of the new pulp and paper mill of the Florida Pulp and Paper Company, Pensacola, Florida. As the accompanying pictures show, the mill is well under way and construction work is proceeding rapidly. Total cost will amount to $3,000,000. A brief review of the formation of this new organization is presented herewith.

Announcement

First announcement of the Florida Pulp and Paper Company's organization was released to the public during October, 1939, at which time it was made known that James H. Allen had resigned from the Union Bag and Paper Corporation to head the new firm.

Site

Members of the Pensacola City Council assisted in the selection of a suitable site. Options were procured on several sites in and around the Florida city with the result that a strategic location known as *Cantonment* was selected. This 600-acre site is just a few miles west of Pensacola and on the waterfront.

Designers

Selection of architects and engineers took place during the month of October, 1939. Rust Engineering Company was given the contract to build the plant. Hardy S. Ferguson, of New York, was chosen as consulting engineer.

Construction

Work began on the new pulp and paper mill in August, 1940, including several large units for pulp and paper-making divisions, a power house pumping station and auxiliary buildings.

Above—
Looking over the layout toward the north.

Left—
Flushing a well that will supply the mill with plenty of fresh water.

Right (next page)—
Reading from top to bottom:
1—Office building.
2—Machine room at right of office building.
3—Looking west toward office and superstructure for machine room.

Cantonment . . . near PENSACOLA

J. H. Allen, president

Forestry Policy

The Florida Pulp and Paper Mill owns outright 125,000 acres of land valued at approximately $1,250,000. By using the timber from these holdings through selective cutting and employing scientific forestry methods, the company plans to carry on its forestry operations profitably. Through this method the paper mill will be assured of suitable and permanent raw material supplies and employment will be given to many.

Manufactures

The new mill of the Florida Pulp and Paper Company will manufacture white book and wrapping paper in addition to bond paper.

Personnel

The personnel of this company includes some very well known figures in the pulp and paper industry. James H. Allen, formerly with the Union Bag and Paper Corporation, is president of the Florida concern, and John Gamble, also formerly with Union Bag, is vice president and general manager. A. D. Pace is vice president and treasurer, and J. C. Pace is vice president. The Pace brothers are well known saw mill operators of northwestern Florida. J. McHenry Jones is secretary of the company and R. C. Seip, resident engineer for Hardy S. Ferguson during the building of the Crossett Paper Mills, is chief engineer.

WIS. PAPER MILL MEN STUDY WAGE AND HOUR ACT

More than 150 Wisconsin pulpwood cutters and a score of paper mill officials met at Rhinelander, Wisconsin, December 16 to study and discuss the Wisconsin and Federal Fair Labor Standard Laws.

Thomas O'Malley, regional director of the wage and hour division, told the men that they were covered by the fair labor standards act and must comply with its provisions. He stressed the "hot goods" section of the act which makes it illegal for anyone to ship goods across state lines which has been manufactured in violation of minimum wage and overtime provisions. Such shipments, Mr. O'Malley pointed out, may be halted by injunction. Paper mills were warned that they must be certain that the pulpwood they buy was cut by workers paid at least 30 cents per hour and time and one-half for overtime.

Paper mills represented at the meeting included the Nekoosa-Edwards Paper Company, Wausau Paper Mills Company, Marathon Paper Mills Company, Tomahawk Kraft Paper Company, Mosinee Paper Mills, Rhinelander Paper Company and the Consolidated Water Power and Paper Company.

◆

FINANCIAL

The market for paper mill securities ended the year with few radical changes from the end of 1939, even though the year has been marked by heavy production and increased profits. The problems of the future have served to discourage speculative trading, and with no demand from purchasers the prices have remained close to those of 1939. There have been wide swings at times, but the general rule has been after a flurry of such activity a return to the original quotations.

Central Fibre Products Company—Net income for the year ending June 29 was $712,224, as compared with $356,033 for the preceding fiscal year.

Champion Paper and Fibre Company—For the twelve weeks ending November 10 net profit was $356,817, as against $405,428 for the similar period in 1939.

Container Corporation—Net earnings for the year ending September 30 were $3,093,243, as against $418,884 for the preceding fiscal year.

Continental Diamond Fibre Company—Net earnings for nine months ending September 30 were $331,556 and $84,086 for the quarter ending on that date.

Crown Zellerbach Corporation—Net income for the six months ending October 31 was $3,836,975 as against $1,886,315 for the second of the two quarters.

International Paper Company—Net profit for the quarter ending September 30 was $3,937,658, as against $635,133 for the same quarter in 1939, and the earnings for nine months to September 30 were $2,214,551 as against $725,301 for the same period in 1939. Much of the year's earnings have been applied to the reduction of bank loans. The Securities and Exchange Commission has disapproved a proposed refunding plan which would involve a bond issue of $32,000,000 and bank loans of $12,000,000 to effect a merger of two power subsidiaries. The Commission held the proposed merger would not result in a physical connection of the various properties.

Johns-Manville Corporation—The company has called 17,500 shares of preferred stock for redemption at $120 per share plus accrued dividend on January 1.

Lily-Tulip Cup Corporation—Earnings for the year ending September 30 were $595,878, as against $467,675 for the preceding year.

Parker-Young Company—Earnings for the year to August 31 were $90,489 as against $8,299 in the previous fiscal year.

Rayonier, Incorporated—Net profit for the six months ending October 31 was $2,139,109, as against $870,152 for the same period in 1939.

Union Bag and Paper Corporation—For the year ending September 30 net profit was $2,840,849 as against $579,439 for the previous year.

Among recent dividend declaration by paper companies are the following:

Flintkote Corporation—A dividend for the year-end of $1, the same amount paid in 1939.

Gaylord Container Corporation—A dividend of 55 cents for the year-end brings the year's total to $1 as against 70 cents in 1939.

Hummel-Ross Corporation—A dividend of 15 cents per share for the last quarter brings payments for the year to 70 cents, as against 20 cents in 1939.

International Paper Company—Quarterly dividend of $1.25 on preferred, plus $1.25 on account of unpaid dividend accumulations.

Kimberly-Clark Corporation—An extra dividend of 50 cents per share was voted in addition to the regular quarterly dividend of 25 cents.

Union Bag and Paper Corporation—declared a 45 cent dividend for the final quarter, bringing the year's total to $1.

New York Stock Exchange—Stocks Closing Prices

	Dec. 27 1940	Nov. 25 1940	Dec. 31 1939
A.P.W. Paper Co.	1¾	*2⅛	4
Celotex	7⅛	7½	10⅛
Same Preferred	*61–65	63	61
Certain-Teed	4¼	5½	6⅝
Same Preferred	34½	37⅛	35
Champion P.&F.Co.	19½	22½	25
Same Pref.	*103–105½	104¼	100
Container Corp.	14⅞	16	16⅜
Cont. Diamond	7	7⅜	7¼
Crown Zellerbach	15⅛	16⅛	16⅞
Same Preferred	91	91½	89½
Dixie Vortex	9	10¼	11¾
Same "A"	*34–35	36	34½
Robert Gair	2⅛	2¾	3⅜
Same Preferred	*18–18¾	15⅝	15⅜
Gaylord Container	10½	12½	13
Same Preferred	*45–49	49	—
Inter. P. & P. Co.	14⅞	17⅜	14
Same Preferred	66¾	69⅝	56½
Masonite	26¾	—	36¾
MacAndrews & Forbes	31	31	34⅜
Mead Corp.	8	9½	11¼
Same Preferred	*75–79	*75–80	—
Paraffine Co.	33¼	38	40½
Same Preferred	105⅝	*99¾–103	100
Rayonier	16⅞	17⅞	18⅞
Same Preferred	27¼	27½	28½
Scott Paper	34⅛	38	48½
Same 4½% Pfd.	*109-115	112	—
Same 4% Pfd.	*111½	108½	—
Sutherland Paper	21	23	29¼
Union Bag & Paper	11⅞	13½	13
United Paperboard	3¼	4¼	5
U. S. Gypsum	63	68	83¼
Same Preferred	*178–180	174	173½

New York Stock Exchange—Bonds

Abitibi 5%	46	—	—
Celotex 4½%	88¼	88¼	87½
Certain-Teed 5½%	86½	89	73½
Champion P.&F.Co. 4¾%	106½	105⅜	104¾
Container Corp. 5%	—	—	102¼
Inter. P. & P. Co. 5%	103¼	102⅜	103
Same 6%	103½	105	103

New York Curb Exchange—Stocks

Am. Boxboard	4⅛	4¾	6⅞
Brown Co. Pfd.	15½	19¼	27⅜
Great Northern	*40-42	43	44
Hummel-Ross	5¾	6¾	5½
Nat. Container	*10¾–11⅛	11½	10
St. Regis	2⅜	2⅜	3
Taggart	3	4	6
United Wall Paper	1⅜	1⅜	1⅞

*Closing Bid and Asked Prices

◆

SUTHERLAND TO OPEN NEW BOTTLE PLANT

For the first time in its 23-year history, the Sutherland Paper Company, Kalamazoo, Michigan, had net sales totaling more than ten million dollars, it was announced recently.

President Louis W. Sutherland also announced that prospects for 1941 business are even greater, adding that the company will enter into the manufacture of paper milk bottles the first of the year. Orders for several thousand dollars worth of paper bottles have already been received, although the

● CAN YOU ANSWER THIS QUESTION? . . . IF YOU CAN'T, YOU WILL WANT TO KNOW JUST WHAT CYCLIFINING CAN ACCOMPLISH FOR YOU

Cyclifining is simple. Hook up the Miami cyclifiner, a specially designed refiner, to beater, chest, vortex beater, or pulper, and you're ready to cyclifine your stock. Here's what over a hundred mills are accomplishing: They refine at consistencies up to 6-7% and still get fast, thorough results. ● They get greater control and can duplicate runs exactly. ● They handle large batches or operate continuously. ● They save on power because 75% of it goes for stock treatment, only 25% for circulation. ● They save on floor space because existing equipment is part of the system.

Here are typical cases: cyclifining will lower the freeness of a 12,000 gallon batch of sulphite or hard ledger 100cc in just 48 minutes. For the same size batch of hard kraft, it takes only 132 minutes to lower the freeness 100 cc.

Remember, cyclifining is **simple.** And **inexpensive.** And **easily installed.** And a definite **money saver** as we can prove to you. No obligation, of course.

SHARTLE BROTHERS, MIDDLETOWN, O. OPERATED BY THE BLACK-CLAWSON CO.

Shartle Brothers CYCLIFINING SYSTEMS

plant cannot be ready for operation on regular production before February 1. A $50,000 plant is being completed to house the new machinery to be brought here from the Baltimore plant of the Purity Paper Vessels Company.

The Sutherland company purchased the business and machinery of the Purity Paper Vessels last fall. All the manufacturing will be transferred to the new Kalamazoo plant and about 40 persons are expected to be employed on the four machines. Overhead conveyors and other automatic equipment make the new bottle plant one of the most modern in the world, Mr. Sutherland stated.

The new unit is built beside a New York Central railroad right-of-way. The plant, 335 feet long and 70 feet wide, is one story high and is constructed of concrete and steel. The interior is lined with cream-colored tile to meet the strict sanitary requirements of the industry. Purity's cone-shaped bottle will be manufactured by Sutherland in three different sizes: quarts, pints and half-pints. It uses regular size milk bottle caps and may be filled on a standard milk-filling machine. Mr. Sutherland said that the company received a Chicago order for 20 carloads to be delivered within the first six months of 1941.

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CANADA'S WAR BUDGET AFFECTS U. S. PAPER MILLS

Important regulations affecting papermakers in Canada and the United States have come into force with the issuance of Canada's new war budget. In order to conserve foreign exchange and increase the Dominion's trade with Great Britain, the following paper-based articles are barred from import into Canada from the United States:

1) Wallpaper, paper hangings, borders or bordering.

2) Towels, napkins, table covers, tray covers and paper doilies.

3) Paper handkerchiefs, facial tissues and toilet paper (not including such materials in jumbo rolls).

4) Cups, dishes, plates, forks, spoons and drinking straws made of paper, cardboard or of vegetable fibers.

5) Correspondence and printed letterhead paper (not including plain unprinted typewriter or copying papers).

6) Creped tissue paper and manufactures thereof.

7) Wrapping paper including box cover paper and wrappers, printed, embossed or otherwise decorated.

8) Pictorial postcards, greeting cards and similar artistic cards and folders.

9) Periodical publications (unbound or paper bound), paper consisting largely of fiction or printed matter of similar character including detective, sex, western and alleged true or confession stories and publications (unbound or paper bound) commonly known as comics but not including bona fide supplements used with newspapers.

10) Playing cards in packs or sheet form not otherwise provided for including cards and sheets partly lithographed or printed for use in the manufacture of such playing cards.

◆

$6,000,000 EXPANSION AT GAYLORD CORP.

Plans are now practically complete for the expansion and improvement program to be carried out during 1941 in the pulp and paper mill and bag plant of the Gaylord Container Corporation, Bogalusa, Louisiana. The expansion program will involve an expenditure estimated at $6,000,000.

In the mill division the principal items in the program will include a plant for bleaching sulphate pulp, with necessary additions to the pulp mill to supply the added pulp requirements, and substantial additions to the power plant to furnish the increased steam and electricity required. One fourdrinier and one cylinder machine will be completely equipped to manufacture fourdrinier and cylinder bleached papers, boards and specialties.

These additions will enable the mill to add to its present line of products a complete line of white bag and wrapping papers, white butcher's papers, folding carton boards, boards for the manufacture of paraffined ice cream and butter cartons, tag and folder stocks, solid white and white lined container boards, and many other full-bleached and semi-bleached specialties. This new line is planned to be the major part of the mill expansion, as the volume of liner board is not expected to be greatly changed and the increase in paper production is only planned to balance the added bag production with its corresponding paper requirements.

Additional equipment to be installed in the pulp mill will include chip screens, digesters, washers, evaporators, a recovery unit, lime slackers, white liquor clarifier, screens, knotters and thickeners. Swenson Evaporator Company will furnish pulp washers and evaporators. Combustion Engineering Company will install the recovery unit. In the power house new Riley boilers and a Westinghouse turbine will be installed. E. H. Barry of Boston is consulting engineer on power plant improvements.

Work is already under way on several of the new additions and will be pushed rapidly throughout the new year. Several hundred men will be directly and indirectly employed during the course of the year in the various trades connected with the erection of buildings and installation of equipment. It is expected that permanent employment will be given to something short of 200 additional men and women at the conclusion of the program which should near completion toward the end of 1941. Announcement of the Gaylord Container Corporation's expansion and improvement plans was issued by Vertrees Young, executive vice president of the company.

◆

FORMER TRIBUNE BOAT SUNK IN EUROPEAN WAR

News has been received of the sinking of the "S. S. Thorold," formerly of the *Chicago Tribune* fleet. The "Thorold" was one of twenty-one Great Lakes ships taken over by the British Admiralty and sailed to England last summer to augment British shipping. Sunk last August in a German bombing raid off the Welsh coast, the ship went down with nine casualties. Paper-carrying ships have also been lost by the Anglo-Newfoundland Development Company and by Bowater's Newfoundland Pulp and Paper Mills.

◆

FIBER FROM CACTI—PLAN FOR NEW MILL

Fiber from desert cacti, at the rate of 15-tons per day, is planned by the General Fiber Products Corporation, Los Angeles. The company is proceeding with plans for the construction of such a plant in Kingman, Arizona, the center of a large cactus producing center. This unit will manufacture fiber from a species of cacti known as Yucca which will be used in place of imported fibers such as sisal, hemp, etc. In manufacturing this fiber there will be found a by-product powder which has already been found very satisfactory as an industrial cleaning agent.

At present work is under way to investigate the further use of the powder in the production of plastics. Other by-products are expected to be available as the operation of the plant gets under way. C. L. Wells is president of the company and Herman L. Joachim is consulting engineer.

When Pulp Prices are Highest

HAMILTON FELTS ARE MOST ESSENTIAL

Right now, many a paper mill could make more money by selling its pulp than by converting it into paper. It matters not whether you are using northern spruce or southern loblolly — your costs are high — very high. You can't reduce pulp prices; your labor costs are pegged; your taxes are terrific. The only place you can cut down your costs is at your paper machines. Equip them with

HAMILTON FELTS

Hamilton Felts remove more water *faster* and more uniformly. They enable you to increase the speed of your machines because they deliver a dryer sheet to the drier rolls — require less steam and less time for drying — practically eliminate stops for adjustments and broke. Hamilton Felts increase productive time without running into overtime.

• *From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.* •

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

HOW SOME MILLS KEPT CHRISTMAS

▶▶▶ AT THE ANNUAL CHRISTMAS PARTY of the Neenah Paper Company, it was revealed that 85 of the employees have been with the company over twenty years and that thirty of them have been with the organization for over thirty years. The oldest employees in point of service were Mamie Straus and William Owen who have been with the Neenah Paper Company for more than 50 years.

▶▶▶ SCOTT PAPER COMPANY rewarded its employees with a Christmas service award. Employees who joined the company before January 1, 1939, received $25 plus $1 for each additional year of continuous service after the first year. Employees who joined the company between January 1, 1939, and December 31, 1939, received $12.50 and those who came with the company between January 1, 1940, and December 20, 1940, received $5.00. The award was made, according to a statement by the company, in sincere appreciation for the splendid co-operation and loyal effort put forth by the men and women in the company.

▶▶▶ THE KALAMAZOO VEGETABLE PARCHMENT COMPANY shut down completely for the first time this year on December 20 while its 1,500 men and women employees gathered in the Parchment Community House for the company's annual Christmas party. Cash bonuses were given to every employee and all received a box of food, as has been the company's custom at these parties for the past thirty years.

Jacob Kindleberger, founder of the company and chairman of the board, presided at the party. Officers and directors of the company sat in a body near the stage. A choir of 50 men and women employees formed the background for a musical program that included several solos and specialty selections. The audience joined in hymn singing. Among those gathered in the beautifully-decorated auditorium were company employees from the Chicago, Detroit, Cincinnati, Philadelphia and Omaha branch offices.

Featured guest of the day was Homer Rodeheaver, nationally known trombone playing evangelist, who came to the party for the second consecutive time. He played several trombone selections, led the group singing and told several of his short stories. A half-hour concert by the band preceded the program.

▶▶▶ THE BRYANT PAPER COMPANY of Kalamazoo, Michigan, presented each employee with a large precooked ham for Christmas.

▶▶▶ EVERY EMPLOYEE OF THE three Allied Paper Mills, Kalamazoo, Michigan, was presented with a turkey for Christmas by Frederick C. Fischer, vice president of the company. This gift was a personal one from Mr. Fischer. The company gave each employee a $5 bonus a few days prior to the holiday.

▶▶▶ BONUSES AMOUNTING TO $15,850 were distributed to employees of the Watervliet Paper Company, Watervliet, Michigan. This is the sixth consecutive year that the firm has given employees a Christmas bonus of three per cent of their annual earnings. The company payroll rose to $600,000 this year, the largest in its 30-year history, George K. Ferguson, president of the company, said. More than $200,000 was spent for replacement and improvement of equipment during the year.

WISCONSIN TO PROTECT PINE FORESTS

In a determined move to save Wisconsin pine forests, the State and U. S. Departments of Agriculture are, with the co-operation of the State Conservation Department and the University of Wisconsin, mapping the boundaries of all possible pine stands of commercial and esthetic value. This work is being done in preparation for a spring campaign to eradicate currant and gooseberry bushes in and adjoining the pine stands, as these bushes are prolific carriers of blister rust.

In spite of early snow and cold, the work was begun on schedule and will continue throughout the winter. Special attention is given to the mapping of young white pine, and in all cases only those stands are mapped for eradication which are of sufficient value to justify the cost of the work. This assures adequate eradication where it is really needed, rather than haphazard attempts to cover various sections regardless of cost or need.

White pine is increasing in Wisconsin, not only through state reforestation, but also because it is seeding naturally. The state has over a million acres of white pine and, of this, about 364,000 acres are of sufficient value to justify the costs of protection. In 1940, initial protection was given to well over 16,000 acres by eradication of more than 5,384,000 currant and gooseberry bushes from the stands. Approximately 14,400 acres were reworked by the removal of more than 1,318,400 Ribes from 45,500 acres. Protection must include an area of 900 feet in width adjoining the stand to be really effective. In quite a number of cases owners of white pine stands perform the blister rust control work themselves; in other cases they are assisted by state or federal control groups.

◆

PORT MELLON OPERATING CO. TO RE-OPEN

The Port Mellon Operating Company, Howe Sound, B. C., plans to begin production in the near future. Idle for two years due to the collapse of the Japanese market, the mill will produce kraft paper exclusively. It is understood that most of the output will go to United States markets, probably in the Middle West. The company is owned by Portland (Oregon) capital.

Pulp and paper conditions on the Canadian Pacific coast are, in general, at a high standard. The Powell River Company and Pacific Mills, Ltd., are both maintaining capacity and expanding outputs of unbleached sulphite and other products, while Westminster Paper Company and the Sidney Paper Company report this as their best year. The British Columbia Pulp and Paper Company is also operating its two mills at capacity in the production of rayon and bleached sulphite.

◆

OFFER NEW PLAN FOR ABITIBI'S REORGANIZATION

Probably the outstanding development at the recent hearings relative to the reorganization of the Abitibi Power and Paper Company was the plan submitted by J. Ernest Guité, of Percé, Quebec, a minor shareholder. Mr. Guité suggested that the commissioner order the company to remain in receivership and that the receiver-manager should pay the bondholders 20 per cent interest—equal to four years' interest—in four equal quarterly payments of 5 per cent in 1941, the same in 1942, and 15 per cent in 1943. By the end of 1943, Mr. Guité stated, Abitibi would be free of overdue bond interest and the company could be

turned over to the shareholders. This proposal, it was reported, caused considerable interest and the commissioners and the interested parties examined it closely.

The Royal Commissioner investigating the affairs of the Abitibi Power and Paper Company is headed by Justice Charles P. McTague. Hearings were held on December 9-11 and were to be re-opened January 6.

◆

K-C DEDICATES NEW WADDING MILL

A dedicatory program lasting all afternoon and evening took place on December 16 at Neenah, Wisconsin, upon completion of the new Badger-Globe mill and bridge of the Kimberly-Clark Corporation. Sixteen hundred persons were in attendance for the dedication and open house which was followed by a dance in the evening.

The ceremonies were opened as F. J. Sensenbrenner, president of K-C and Mayor Edwin A. Kalfahs of Neenah, cut a ribbon stretched across the roadway of the new bridge which spans the Fox River Canal from Church Street to the new mill. Ernst Mahler, executive vice president, dedicated the mill. J. H. Kimberly was master of ceremonies.

Mr. Mahler dedicated the mill "to the service of the community and to our customers." He compared the new plant with the old mill which adjoins it and which was built in 1872. In building the new unit, the company set a record of not one single lost-time accident.

The ground occupied by the plant covers an area of 17,176 square feet and the mill itself has an area of 55,500 square feet. It will be used for crepe wadding. The building is 227 by 75 by 71 feet and is streamlined and air conditioned. The mill contains more glass brick than any building in Wisconsin, it is said. Operations will commence the first of the year.

The Kimberly-Clark band led a procession from the bridge into the new mill and supplied music during the tours of inspection which followed the dedication ceremonies.

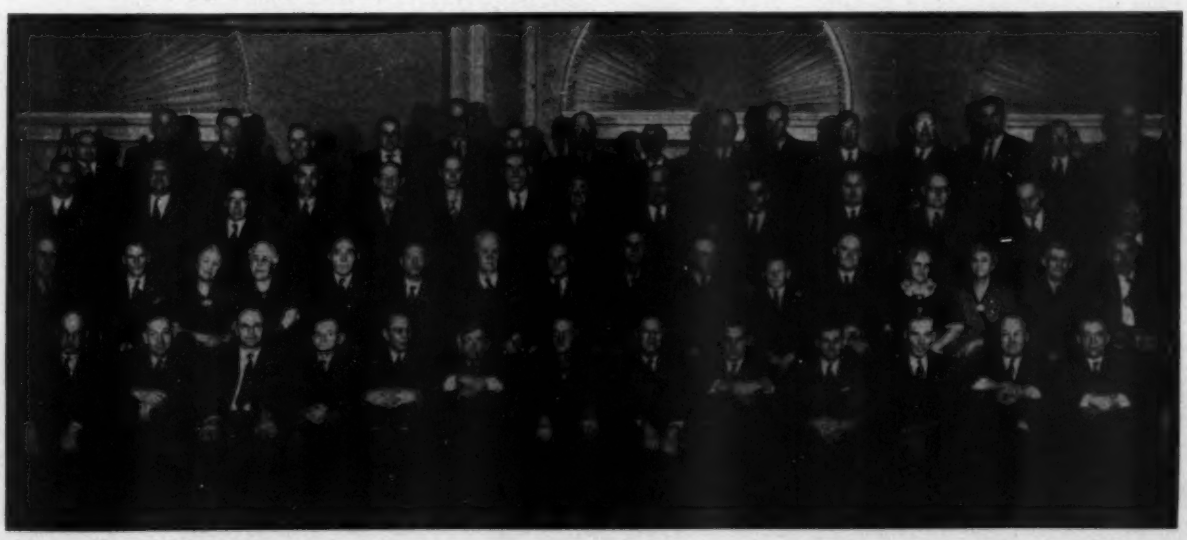
The Fox River Corporation, Appleton, Wis., entered its third year with the reopening of the Ravine mill, its four unit, on December 1. Three of the company's units are shown in the above illustration. The Ravine mill is in the center background.

BRYANT'S 25-YEAR MEN ARE HONORED

Members of the Bryant Paper Company's Twenty-Five Year Club were honored December 14 at a banquet tendered them by the officers and directors of the Kalamazoo (Michigan) company.

The program included a talk by W. J. Lawrence, president of the Bryant organization who acted as master of ceremonies and several short talks by Mayor Frank E. McAllister, Dr. Rudolph Gilkey, a director of the firm, and Billy Geal, who spoke for the Twenty-Five Year Club Members. In addition to these addresses there was a musical program and a dramatic offering, "Christmas Eve," by the Bryant Dramatic Club. Presentation of service certificates was made by Mr. Lawrence after which moving pictures of west coast timber and pulp manufacturing were shown.

Bryant Paper Company's Twenty-Five Year Club.



TESTING LAB. PLANNED FOR N. U. TECH. INST.

A materials testing laboratory for the purpose of studying the behavior of metals, concrete, wood, plastic and other materials under stress and pressure will be established in the new Technological Institute of Northwestern University, Evanston, Illinois. The equipment for the new laboratory will cost about $900,000.

Among the types of equipment to be installed there are included a universal testing machine of 120,000 pounds capacity for bending, compressing and stretching beams or columns; a hydraulic press capable of exerting a pressure of 5,000,000 pounds for testing concrete and other materials; a transverse-universal testing machine for measuring strain on steel beams and columns, and special pieces of equipment for studying the characteristics of materials under tension.

The new materials testing laboratory will be located on the second floor of the new building and, it is claimed, will be outstanding among universities in the country.

◆

PAPER BOTTLES MAY ELIMINATE "SUNSHINE" TASTE

Paper milk bottles may provide the way to eliminate the "sunshine" taste acquired by milk, especially the homogenized type, when subject to the sun's rays, according to evidence found by University of Wisconsin scientists. Paper containers proved most effective in experiments to determine satisfactory means of preventing this taste.

The experiments at the University of Wisconsin were in charge of J. C. Flake, K. G. Weckel and H. C. Jackson. While the cause of the taste is still in doubt, the scientists believe it to be a sulphur bearing compound, it was stated.

◆

1940 PRODUCTION BREAKS RECORDS

The year is ending with the paper industry showing a total production in excess of any previous record. The production was about 3 per cent above that of 1939, the previous banner year.

All indications for 1941 are that the production of 1940 will be materially exceeded. Domestic requirements which could not be filled by imported papers formerly coming from Scandinavia are in no small measure responsible for the increased output and the demands of Latin America and other parts of the world for paper which they could no longer secure from Europe, has been another factor. This demand is likely to increase.

The sentiment of the best judges of market conditions is that while 1941 will be a banner year in production, the defense taxes will serve to prevent undue profits to the manufacturers. The industry has been careful to avoid price increases during the past year, trying to hold the prices to a point which will produce a normal profit only after taxes are paid, and the price situation has thus been stabilized at reasonable levels, even though it is usual in such times of heavy demand for the mills to average up their earnings to compensate for the low income periods which are always of longer duration than those of peak prices. Profitless prosperity is a phrase which possibly will be used more and more often during 1941.

WISCONSIN PAPER INDUSTRY VIEWS POST-WAR PROBLEMS

An employer-employee campaign for the enactment of federal legislation to protect America's pulp and paper industry against destructive post-war prices from a flood of European imports was set in motion at a recent Green Bay conference of a representative group of manufacturers and members of paper mill unions from Wisconsin, Minnesota and Michigan.

Said to be the initial effort of its type in the country, the joint conference pledged unanimous support to a resolution calling for the appointment of a special committee of manufacturers and international union leaders to recommend such federal legislation as will be "a practical solution of the problem of protecting the United States" pulp and paper industry after the war.

About 20 manufacturers and close to 150 union delegates approved the resolution. The conference, a one-day affair, was sponsored by the Tri-State District council of the International Brotherhoods of Pulp, Sulphite and Paper Mill Workers' union and the Paper Makers' union and all mills in the three states were invited.

J. M. Conway, president and general manager of Hoberg Paper Mills, Inc., Green Bay, and Alex Schoen, Green Bay, Tri-State council president, were co-chairmen of the meeting and the conference named them to appoint the joint committee.

Observing that industry is desirous of maintaining the American standard of living for the working man and a reasonable stability of the entire pulp and paper industry, the resolution declared that such a standard would be impossible if the domestic market is flooded with low cost imports of post-war pulp.

The industry needs the protection of amendments to the present "anti-dumping" law or new legislation to afford the protection, the measure also stated. The committee is directed to confer with the International Brotherhoods and manufacturers to determine what movements, if any, are underway to meet the problem, and then to recommend to the Tri-State council, manufacturers and "others who may be interested" a definite federal legislative program.

In an address to the conference, Mr. Conway pledged his wholehearted support to assist the campaign. "Post-war competition will necessitate federal legislation to protect our markets because American producers form the basis of the average cost of our production," he asserted, and, praising the plan, added: "In the final analysis, the great lesson we learn by meetings of this kind between employee and employer, united for the good of all, is the miracle of our strength when we stand together."

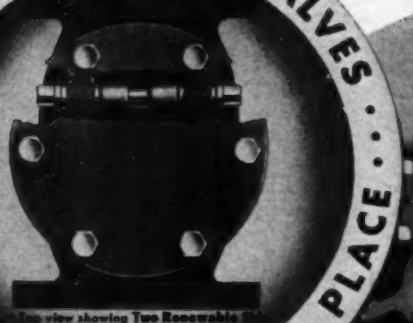
John Burke, president of the Pulp, Sulphite and Paper Mill Workers' brotherhood, told delegates his organization "is ready and willing to get behind a practical legislative program to protect the American pulp and paper industry." Pointing out that foreign pulp imports are extremely negligible at the present time, Mr. Burke urged that self-contained mills selling pulp to converters and other mills which do not produce any cultivate friendly relations. "Keep your prices right; keep these mills and converters as your customers after the war and a big part of the problem will have been solved," he said.

Several other manufacturers present expressed a desire to cooperate. Among others who spoke were Arthur Huggins, international president of the Paper Makers' union; H. W. Sullivan, second vice president of the Pulp and Sulphite Workers, and James Killen, Pacific coast representative of the same union.

Endorsement of the Tri-State council-manufacturers' program has been given by Alexander Wiley, U. S. senator from Wisconsin. In letters to Messrs. Conway and Schoen he promised "wholehearted support" and observed that the American pulp industry needs adequate protective measures against destructive post-war competition.

NO. 10 OF A SERIES

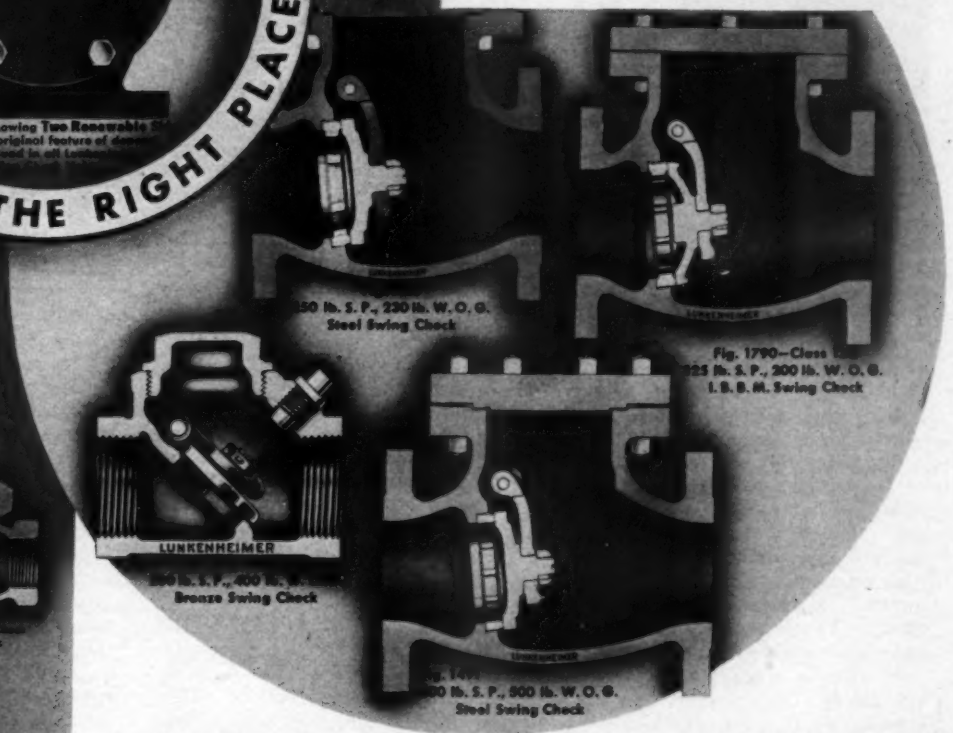
CORRECTLY ENGINEERED VALVES . . . IN THE RIGHT PLACE . . .



Where Dependability is the Measure of Valve Economy

LUNKENHEIMER CHECK VALVES

ARE "CORRECTLY ENGINEERED" FOR MAXIMUM ECONOMY ON THE JOB!

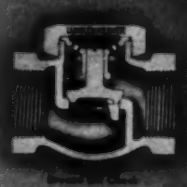


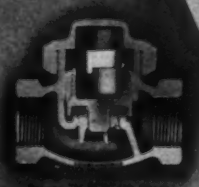
250 lb. S. P., 230 lb. W. O. G. Steel Swing Check

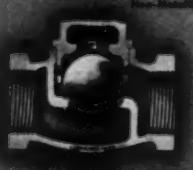
Fig. 1790—Class [illegible] 225 lb. S. P., 200 lb. W. O. G. I. B. B. M. Swing Check

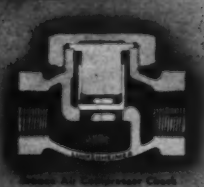
[illegible] lb. S. P., 400 lb. [illegible] Bronze Swing Check

[illegible] 00 lb. S. P., 800 lb. W. O. G. Steel Swing Check









● DEPENDABILITY in check valves is important! Their satisfactory performance means safe operation and protection of valuable equipment. They must be tight; they must stand guard against reverse flow in a line, which might endanger not only equipment and processes, but human life as well; they must protect low pressure sections of systems in which both low and high pressures are used.

Any need for a check valve should suggest caution and the exercise of every care in its selection. No other valve is more important.

*All Lunkenheimer Swing Check Valves are provided with two renewable side plugs which serve as bearings for the disc carrier pin. Should a pin become worn, causing misalignment and ineffective operation of the valve, it can be removed from either side—a particularly advantageous feature when valves are installed close to a wall.

SEEING IS BELIEVING

Every year, many valve buyers visit the Lunkenheimer plants in Cincinnati. They've been told about "Correctly Engineered" Valves . . . they come to see, to inspect the iron foundry, the steel foundry, the metallurgical research laboratories, and watch, at first hand, the finer manufacturing in these great valve plants . . . they go away *sold*—not only on a product, but sold on the processes they never before knew went into the manufacture of a "mere valve."

Your Lunkenheimer distributor will gladly show you the many points where "engineered superiority" in Lunkenheimer Bronze, Iron and Steel Check valves guarantees accuracy, safety, and low cost service.

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Send for copy of our new Catalog No. 78. We will include our handy "Guide", for easy selection of valves, boiler mountings, and lubricating devices according to pressures, temperatures, and service applications.

WASHINGTON

▶▶▶ EMPLOYEES OF THE Scott Paper Company called for military training and service will receive a leave of absence of one year and forty days. Men with more than one year of employment at the time they are called will receive four weeks' full pay. Men with less than a year will receive two weeks' full pay. Any man who satisfactorily completes the period of military training and service and who makes the proper application to the company within the prescribed period will be restored to his former position or a like position, unless the company's circumstances have so changed as to make it impossible or unreasonable to do so. The leave of absence will be counted as part of the regular length of service with the company if the employee is restored to active employment. Group life insurance will be continued.

▶▶▶ ASSURANCE THAT ALL EMPLOYEES called for military training will be restored to former positions or to positions of like seniority, status and pay was given recently by J. I. Lyle, president of the Carrier Corporation.

▶▶▶ THE POLICY OF THE Robert Gair Company, Inc., regarding employees who may be drafted for military service is: (1) One month's pay will be given to each employee who has been in the employ of the company two years or more. (2) Employees group life insurance will be maintained at the expense of the company. (3) The employees will be given a leave of absence without pay and such absences will not affect his seniority. (4) The employee will be restored to his former or like position if proper application is made. (5) Present employees who may be promoted to or given positions previously occupied by others called for military training, will hold such positions temporarily. (6) New employees hired to replace other employees on military leave of absence will have the status of temporary employees.

▶▶▶ AN ORDER BY THE Federal Trade Commission issued at Washington, December 18, has ordered the Cup and Container Institute, eight of its officers and directors and twelve corporations to cease fixing uniform prices on their commodities.

▶▶▶ NOW A MEMBER of the staff of Donald M. Nelson, co-ordinator of national defense purchases, is Walter C. Shorter, sales manager of the International Paper Company's specialty division. Mr. Shorter will work with the Quartermaster General of the Army on procurement planning.

▶▶▶ A RULING FROM THE Treasury Department says, in effect, that gratuitous payments made to employees called for military service do not constitute "wages" for purposes of taxes imposed by Subcharters A, and C, Chapter 9 of the Internal Revenue Code.

▶▶▶ THE CURRENT REVISION of the Simplified Practice Recommendation R22-33, Paper, has been accorded the required degree of acceptance by the industry and became effective December 31. The revised recommendation identified as R22-40, establishes basic sheet sizes for bond and writing papers, rag content or sulphite, ledgers (rag content), ledgers (sulphite), looseleaf ledgers, machine posting ledgers (rag content), book paper, index bristol, cover paper and book paper.

▶▶▶ SIDNEY ROOFING AND PAPER COMPANY, Victoria, B. C., has developed its own deferred payment plan for financing roof repair work to replace the Dominion Government Home Improvement Plan now discontinued.

▶▶▶ THE DIVISION OF SIMPLIFIED PRACTICE of the National Bureau of Standards has announced a reprinting and reissuance of Simplified Practice Recommendation R44-36, box board thickness, to meet a continuing demand for the publication. Copies may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C.

WIS. PUB. SERV. PLANS $4,000,000 NEW CONSTRUCTION

A 1941 construction program involving an estimated $4,478,000 was approved by the Wisconsin Public Service Corporation at a recent annual meeting of the board of directors in Green Bay.

The largest project planned is a $2,640,000 addition to the utility's Bayside steam generating plant in Green Bay, one which will more than double the present 66,000-volt capacity. Already approved by the Public Service Commission is the corporation's application for construction of a 66,000-volt transmission line between Green Bay and Manitowoc, Wisconsin, a job estimated to cost $312,000.

◆

SCOTT PAPER CO. TO LAUNCH NEW PULP CARRIER

The Scott Paper Company, Chester, Pennsylvania, will launch, early in 1941, a new 260-foot Diesel-powered motorship which will have a pulp carrying capacity of 3,500 tons. The Scott company plans to put it into service moving pulp from Brunswick, Georgia, and Nova Scotia, to the company dock adjacent to the Chester plant. The Scott company has also purchased additional land on the Delaware River adjoining the present plant in Chester which will serve as a terminal for water shipments of pulp and will provide storage facilities for necessary raw materials.

◆

TREE INSECTS MAY BE A BLESSING

Insects normally termed injurious may be blessings in disguise, according to A. R. Gobeil, a member of the entomological branch of the Quebec Department of Agriculture.

In a speech before the American Association for the Advancement of Science, Mr. Gobeil said that the spruce bark-beetle has caused an economic loss estimated at $100,000,000 in Canadian timber during the last three years. However, he stated, "we might be hardly justified in classifying this insect as economically injurious since it feeds mostly on the surplus tree populations, thus preventing diseases and competition." The insect has what amounts to a mathematical sense, Mr. Gobeil pointed out, since it generally attacks trees eighteen or more inches in diameter thus weeding out overage trees which, when they fall to the ground, are destroyed by fungi and eliminate fire hazards.

BRITAIN NEEDS WALLBOARD FOR REBUILDING

Because of the extensive damage caused to homes and buildings, England is looking to the United States for more building materials says a recent press report. In conjunction with this need Baldwin Raper, former member of the house of commons and an executive of a British wallboard company, conferred recently with officials of building material companies in Chicago.

As a member of the British paper control board, Mr. Raper said he was also investigating the availability of other light building materials. He informed interviewers that since the Nazi invasion of the Scandinavian countries England had lost her main source of supply for wallboard. One of the principal uses for wallboard is for covering windows after the panes have been shattered by bombs dropping nearby, Mr. Raper stated.

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NEPCO MILLS NEAR CAPACITY DURING 1940

The Nekoosa-Edwards Paper Company has operated its mills at very nearly 100 per cent capacity during 1940, according to a statement by John E. Alexander, president and general manager of the company. Encouraging prospects for a good volume of business during 1941 are noted.

The Nekoosa-Edwards Company, which will celebrate its seventy-fifth anniversay in 1941, is continuing its program of diversification, Mr. Alexander stated, to serve a wider market. Nepco has made substantial additions to its plants to increase efficiency and to improve the quality of its products.

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CLAPP ADDRESSES FORESTRY MEET

Speaking at the 40th Annual Meeting of the Society of American Foresters in Washington, D. C., Earl H. Clapp, acting chief of the Forest Service, declared that most of our critical problem areas are in cut-over forest regions where rural incomes are low and rural poverty and unemployment and relief loads high. Mr. Clapp called for a nation-wide forestry action program to help solve these and other related social and economic problems including those of basic farm agriculture.

Mr. Clapp urged public forest acquisition by communities, States and Federal Government, pointing out that forest lands submarginal for productive use under private ownership and other forest lands which owners can't or won't protect, should come into public ownership "when such lands are needed for watershed protection or for solving acute social and economic problems."

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WOOD IMPORTANT TO NAT'L DEFENSE

The importance of forest products in the national defense was stressed in a talk given before the 40th Annual Meeting of the Society of American Forestry, Washington, D. C., by C. P. Winslow, director of the Forest Products Laboratory at Madison, Wisconsin.

Mr. Winslow pointed out that Field-Marshal Hermann Goering had placed wood no less than second in the list of German necessities of war. Mr. Winslow also showed how important wood is for cantonments, shipping containers for explosives, air-raid shutters, assault boats, charcoal for gas masks, rosin for shrapnel filling, etc.

Procedures whereby wood can be turned into motor fuels, edible sugars and synthetic "wools" and "cottons" are well known to American chemists and should the need arise, the United States can adapt the supplies of wood for these purposes, the laboratory head stated.

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SOUTHERN KRAFT ACQUIRES AGAR CORPORATION

The International Paper Company and its subsidiary, Southern Kraft Corporation, has acquired the entire capital stock of Agar Manufacturing Corporation, producers of corrugated kraft shipping containers. The Agar company has a present capacity of 150,000 tons of shipping containers yearly in plants at Whippany, New Jersey; Somerville, Massachusetts; Chicago; and Kansas City, Kansas.

The Agar company will be operated as a subsidiary of International by the present Agar staff under the continued direction of Calvin A. Agar, president of the firm. Mr. Agar will also become a director and vice president of International Paper and Power Company. The Agar organization has for years been Southern Kraft's largest customer for kraft liner board and corrugating material and recently has been purchasing its entire requirements from the Southern Kraft Corporation.

BRIEFS

▶▶▶ RESUMPTION OF ACTIVITIES at the 85-ton sulphate pulp mill of the Port Mellon Operating Company, on Howe Sound, B. C., has been decided upon according to an announcement by representatives of F. W. Leadbetter, president of the company. The plant has been idle for two years.

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▶▶▶ PRICES OF NEWSPRINT to British publishers will be equalized at £26 per ton, according to a recent report. The price fixed in Control of Paper Order No. 27 was issued at the end of November at £28, 10s a ton. This scheme causes the cost of home-produced newsprint that is higher in price to be averaged with the lower-priced imported newsprint.

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▶▶▶ THE ANNUAL SURVEY prepared by the National Industrial Advertisers Association, Inc., contains much information and answers many questions relative to advertising budgets which come before management about this time of the year. To aid in long range planning, averages of the amounts spent for advertising, for selling and the per cent of plant capacity sold, are shown for a 5-year period. Individual copies of this survey may be obtained at 100 East Ohio Street, Chicago, for a moderate cost.

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▶▶▶ ALUMINUM FOIL CAN NO LONGER BE USED in Canada to wrap cigarettes, tea, candy, etc., it was revealed recently. War needs require the material. Composition foil made from lead and tin appears more likely to become the chief substitute for aluminum foil. It can be made on the same machinery but is a heavier product and will make freight costs more. One large tea company is conducting experiments to find if some type of paper could be used to advantage, anticipating that lead may likewise suffer restriction at a later date.

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▶▶▶ THE SEVENTH EDITION of its Standards for the pump industry has just been published by Hydraulic Institute. The enlarged edition has been completely re-written and rearranged and much new material has been added. Recommendations of materials to be used in pumps handling various liquids, instructions for installing and operating different types of pumps, and much other material has been revised and brought up to date.

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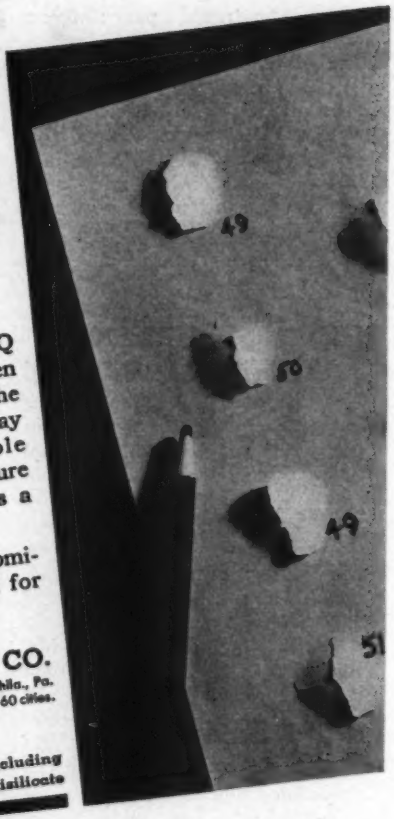

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▶▶▶ PLANS FOR CONSTRUCTION of a $50,000 addition to the Consolidated Paper Corporation's plant at Three Rivers, Ontario, have been completed. The new plant is to be used for storage and distribution. It is expected that it will be completed early in 1941.

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▶▶▶ BOTH DOLLAR VALUE and physical volume of business of Building Products, Ltd., for the year ended December 31, 1940, will show an increase over 1939 when volume of sales reached an all-time high. The company's new building paper mill is now in production.

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▶▶▶ FORMAL APPROVAL of the Federal District Court at Richmond, Virginia, has been given a final plan for reorganization of the Standard Paper Manufacturing Company, as submitted by a stockholders protective committee and approved by creditors.

▶▶▶ CONSERVATION OF NEWSPRINT supplies is urged in South Africa. South African publishers are asked to use a base ratio of 40 per cent news and 60 per cent advertisements, it is reported. Canadian newsprint finds an important outlet in South Africa. At the end of October, that country had bought 31,756 tons in comparison with 23,246 tons for the same period in 1939.

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▶▶▶ THE MINISTER OF LANDS and Forests for Quebec announced recently that he had received $10,000 from the provincial government for scholarships to be given to young forestry engineers wishing to continue their specialized training at different universities.

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▶▶▶ THE COLUMBIA BROADCASTING SYSTEM broadcast an interesting "Story of Newsprint" on December 9. Eastern stations heard the broadcast at 9:15 A. M. while middle and far western stations picked it up at 3:30 P.M. The material in the story was based on two publications of the News Print Service Bureau—*The Story of Ys'ai Lun* and *The Story of News Print Paper.*

ADVERTISING PAGES REMOVED

▶▶▶ THE INTERNATIONAL PAPER COMPANY'S current domestic newsprint prices which are now fixed through March, 1941, will be extended throughout the second quarter of the year at the present level, it was announced recently. President Cullen stated that International's domestic prices for newsprint are still the same as they were before the war and that this announcement should further reassure its many newsprint customers throughout the country.

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▶▶▶ DESPITE MANY BUDGETS which have increased the cost of several commodities to the consumer, Canada is not advancing the price of newsprint. Leading Dominion producers have decided to follow the policy of the International Paper Company and maintain the price of newsprint paper during the second quarter of 1941 unchanged at the base level of $50 a ton.

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▶▶▶ THE REFORESTATION PROGRAM undertaken by Wisconsin counties has proved satisfactory, it was revealed recently. Sale of $1,000 worth of jackpine pulpwood cut from Gordon and Westcott townships was announced by Roy Guest, Wisconsin forester, who pointed to the sale as evidence that the program has begun to yield returns.

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▶▶▶ THE BOARD OF DIRECTORS of the International Paper and Power Company declared a regular dividend of $1.25 a share for the fourth quarter of 1940 and also a dividend of $1.25 a share on account of accumulations on the company's outstanding cumulative convertible 5 per cent preferred stock.

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▶▶▶ A REVIVAL OF IMPORTS of Canadian pulp into Mexico was suggested by the report of the Canadian trade commissioner in Mexico. Mexico consumes a total of about 20,000 tons of bleached pulp annually while the market for unbleached pulp amounts to 13,000 to 14,000 tons a year. In addition there is a market for about 11,000 tons of kraft pulp annually.

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▶▶▶ THE DEPARTMENT OF COMMERCE has published a revised preliminary report of the 1939 Census of Manufacturers on "Pulp Mills." This is similar to the earlier report except for the addition of a third page which supplements the original release. On this third page there appears a table on pulpwood consumption by quantity and cost and by kind of wood for 1939 and 1937.

EDITORIAL

Capacity Demand for Pulp and Paper in 1941

▶▶▶ THE OPERATIONS of the past year have gone into the record of 1940's accomplishment. Looking at the record from the paper industry viewpoint, it has been an unusual and remarkable year. It has been a profitable year for the self sustained paper mills—that is, mills producing their own pulp. But it has not been so profitable for converting mills or for those which are dependent upon foreign sources for their raw material pulp supplies. In addition, the paper merchants generally have had an unsatisfactory year in volume of sales due to the severe curtailment of consumer goods demand.

The self sustained mills made money. The converter mills and the merchants generally did not make money. This marks a sharp division in the paper industry, because heretofore when the big mills made money, the whole industry made profits also.

In 1940, the one basic source of volume production was the pulp division of the industry.

Immediately following the outbreak of the war in Europe, pulp prices began to rise. All those countries, including our own, which had been dependent for all or a portion of their pulp supplies upon the producing mills located in the Baltic area, at once sought other sources for their blockaded pulp. There are no other sources except Canada and the United States. Thus, six separate continents and four other foreign countries lying outside the British blockade of Europe, all came to the North American pulp market.

The demand was insistent and continued persistent throughout the entire year, for in addition to the demand for pulp and pulp products from our own expanding domestic consumers, the pulp and paper mills of this country were called upon to furnish the tonnage which the rest of the world outside of continental Europe, have hitherto purchased from the Baltic area producers.

This was the situation in the pulp and paper industry at the close of 1940, and this excess demand upon North American pulp and paper producers will continue until the war ends, and for an indefinite period thereafter, dependent upon the duration of the war.

We have before us the import figures into the United States for the first eleven months of 1940.

During that period, Sweden, Finland, Norway, other European countries and Canada sent us 993,400 tons of chemical pulp and 160,091 tons of groundwood pulp; a total of 1,153,491 tons against 1,791,022 tons received during the corresponding months of 1939; a deficit difference of 637,531 tons. However, in 1937, which was a peacetime year, we received 2,217,383 tons of all grades of pulp during the first eleven months, which contrasted with 1940's first eleven months' imports, shows a deficit difference of 1,063,892 tons. Now look at the November, 1940, imports of pulp into this country. From Sweden, none; from Finland, 6,363 tons; from Norway, none; from other European countries, none; from Canada, 64,187 tons, a total of 70,550 tons as against a total of 272,049 tons received in the month of November, 1939.

This is a startling deficit difference and should constitute a signal warning to all those 450 paper mills in this country which are dependent upon foreign sources for their supply, that the only source remaining to them is what Canada can spare, and that amount is not to be in excess of 65,000 to 75,000 tons per month during 1941.

With pulp supplies drastically diminished and the demand for pulp and paper products signally increasing, and with paper selling at prices today which do not justify the replacement values of the raw material pulp from which it must be made, there exists no room for doubt as to the maintenance of pulp prices and the constant certainty that substantial markup in paper prices during the coming year must obtain.

How Paper Is Sold

▶▶▶ IF YOU ARE a typical reader of THE PAPER INDUSTRY AND PAPER WORLD, you probably are more concerned with the production of paper than with its sale. It may be that you are a mill manager, superintendent, engineer, chemist, purchasing agent, department head or even the president or some other official of your mill organization; but proof of your interest in the production processes — management, operation, engineering, technology—is evidenced by your reading of this magazine. Of course, you realize that paper must be sold, and sold at a profit, in order for your mill to operate; but, in general, you probably are willing to let this selling job be done by someone else rather than by you.

On this basis, the chances are that you have some definite information on the sales policy of your company, but have little, other than general, information on the job of paper merchandising as a whole. If this assumption is in error, please forgive; but, if correct, a few facts about the wholesale paper trade no doubt will prove both enlightening and interesting.

The facts have been gleaned from data recently presented in a preliminary summary by the United States Department of Commerce of the wholesale trade of the United States in 1939. Here they are:

There were 2,894 service and limited-function wholesalers of paper and its products in the United States in 1939. The sales of these firms that year totaled $559,063,000.

Of the 2,894 wholesalers, 1,670 were listed as wholesalers of wrapping or coarse paper and products; 425, as wholesalers of printing and writing papers; 518, as wholesalers of stationery and stationery supplies; and 281, as wholesalers of wallpaper. The volume of sales, in the order given, for each of the groups was as follows: $294,636,000; $197,009,000; $46,695,000; and $20,723,000.

In addition to the 2,894 wholesalers, there were 321 manufacturers' sales branches which carried stocks, 303 manufacturers' sales offices which carried no stocks, and 480 agents and brokers.

The volume of sales of each of these respective groups, in the order given, totaled $180,926,000, $208,878,000, and $109,172,000.

On the basis of these figures, the volume of paper sales is about equally divided between wholesalers and the other three types of establishments—a slight advantage being given to the wholesalers.

Current Thought

1941

WILLIAM SIBLEY

▸▸▸ NINETEEN FORTY, a year of deepening shadows, has passed into history. A year ago this time, a spirit of uncertainty and foreboding prevailed. During Christmas week a year ago, Americans feared for England; but in England, where bell-ringing is an honored art, brave peals greeted the advent of Christmas and continued their salute throughout the day. During the past Christmas week, Americans feared for themselves—and England's bells were silent except to sound the warnings of invasion alarm.

The year upon which we have recently embarked is sombre in outlook. The shadow of war has cast its grim length over much of the earth. The ability to turn a phrase on one's mental lathe which would kindle hope and cheer in the heart of the reader has been reduced to the ability to deceive. But there is little to be gained in refusal to face facts—indeed, there is much to be lost by willful failure to recognize realities. We need to know the truth. Even more pertinent, we need to think about the truth.

It is not so all-important that we know the truth regarding European war news. Censorship, from whatever side assigned, will soon empty itself upon the rocks of realism. But we need to know, and to think about, and to abide by, the truth concerning ourselves.

At present, America's chief concern lies within our economic boundaries. As President Roosevelt pointed out just prior to New Year's Day, "America must become the arsenal for Britain as well as for ourselves." Being an arsenal is being in big business. Six months ago our government was pouring orders into our economy at the rate of approximately $150,000,000 a month. Today it is in the neighborhood of $350,000,000 a month, and when the full program gets under way, doubtless it will be veering upward toward $750,000,000 per month. This volume does not take into account the orders being piled on us by England which, even now, is being done at an unparalleled rate.

With productive capacity at such an unprecedented level (it is now about 12 points over the peak of 1929, according to the *New York Times*), there are obvious questions which rise in the minds of everyone. One such question might be: What will happen if the war ends suddenly? Of course the termination of the war, either through a defeat or a negotiated peace, would cause a severe business reaction, but in all likelihood only a temporary one, since our defense program would without doubt be continued in any event.

Will inventories become overextended? There is little reason to believe that this has happened as yet. With war forcing priority placement of deliveries, however, there is the natural tendency on the part of many to overbuy. This is something that should be watched, because the sudden stoppage of buying, either through overstocking or the effect of bottlenecks, can create serious distortions that might extend throughout our entire economic system.

Will the Government interfere with and hamper productive business? There is little possibility of commenting sanely on this question. Considering the radical developments and attempts of the past eight years—anything might happen. Policies concerning the financing of the deficit, of taxation, of priorities on deliveries, of the control of prices, of a system of rationing, of the drafting of man power—all have immensely important bearing on uninterrupted, capacity production. While it is foolish even to hope that no errors will be made in the handling of these problems, I personally feel that such errors will not be of dominating importance.

Will there be widespread industrial strife? Probably not. There is considerable evidence that we are in for a period of relatively good co-operation between labor and capital. Obviously, if we must endure a wave of strikes, shutdowns, or lockouts business will be hurt seriously. This, however, will obtain only if labor or industry attempts to use our defense program as a means for selfish gain. In my own mind, I cannot sell America that short.

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▸▸▸ IN THE LAST SPEECH of the late Lord Lothian, the ambassador told the American people: "The issue (he was speaking of the European conflict) now depends largely upon what you decide to do." Speaking slowly and gravely, he continued: "May the year 1940 be pointed to by our children as another period when democracy justified its existence as the best instrument of government yet devised by mankind."

The Paper Industry in NATIONAL DEFENSE

A. N. WECKSLER

▸▸▸ WITH INDUSTRY AND COMMERCE fast reaching new production peaks under the impetus of National Defense, the pulp and paper industry is in the midst of a far reaching survey to discover how to best meet the emergency. And the industry faces a greater problem than any other, for of all great American industries, the pulp and paper industry has a greater dependence on European materials than any other major industry, with the exception of such specialty foods as coffee and tea where the entire production is foreign.

To meet the problem, the pulp and paper industry must first make up the loss incurred by the blockade of Europe, which cut off the large amount of sulphate and sulphite pulps which formerly came from Europe, and when this deficit of supply is met, there is the considerable problem of supplying the increased consumption due to our defense efforts, and the attendant industrial expansion.

There is little exact knowledge of the demand that will be made on various industries. The precise fact is that there will be a great stimulation of commerce with the resultant increase in use of all types of industrial, commercial, construction and cultural papers.

Shortly after the outbreak of the European conflict there appeared to be no shortage of pulp and paper to the uninitiated. Actually, the National Defense Commission at that time announced there was no shortage. This announcement was for a specific reason.

The result of the announcement was to minimize premature speculation. However, in addition there was little immediate danger of shortage. The United States had acquired huge reserves in anticipation of a possible disruption of European commerce, and these reserves cushioned rising prices.

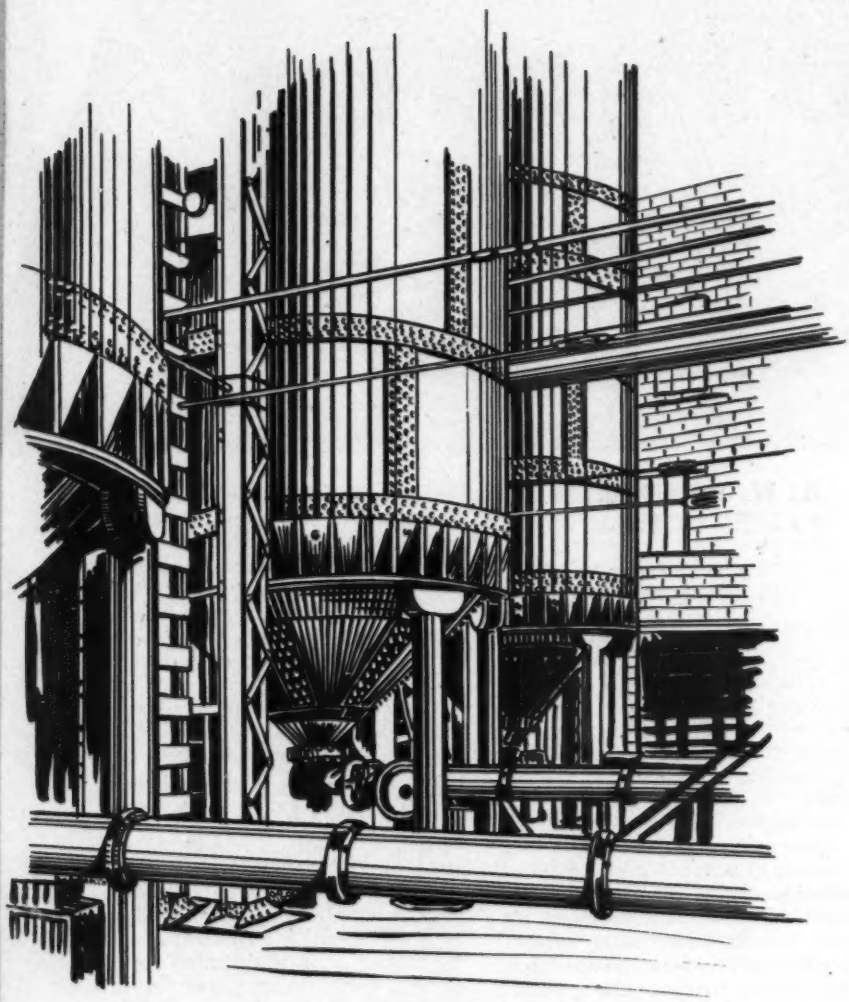
However, it soon became apparent that an upward price trend was inevitable. The Russian-Finnish war immediately affected shipments from Finland. Following the German invasion of Norway, shipments to the United States were practically cut off; only small tonnages have been received since that time, these shipments coming in from Petsamo, Finland. Ocean travel became hazardous. Freight rates increased. Insurance rates became higher. Bottoms became scarce, and long delays were encountered in contacts with German and British contraband control stations, and as a result of all these factors the price shot up sharply.

In contrast, the domestic price lagged, as at first there was not the same stimulus for higher prices in the domestic production. Then the domestic price became entangled in the skein of a rising market. The statistics of the industry show that domestic prices climbed until a counteracting element entered into the picture.

First of all, the United States turned to Canada for a greater production, and then the increased price brought new United States production into the field.

This new production was obtained first by stimulating existing plants to capacity operation; then mills, for-

Courtesy photographs:
Above—*Popular Aviation*
Below—The Jeffery Manufacturing Co.



merly idle, were put into production. Finally, self-contained mills put so-called excess pulp on the market.

The United States production for the first ten months of 1940 increased by 29 per cent over the same period of 1939. This increase went a long way in compensating for the absence of European supply. This lost source of supply meant that during 1940, the United States imported 1,006,000 tons less of wood pulp than in 1937, the latter being a peak year in the industry. Incidentally, the Canadian imports to this country increased 80,000 tons in the comparison between 1939 and 1937.

A comparison between 1940 and 1939 imports from Europe shows that in 1940 the United States imported during the first ten months of the year 642,000 tons less of wood pulp than during the same period of 1939. In this comparison, the Canadian imports are much larger, with 1940 imports during the first ten months of the year being 206,000 tons higher in 1940 than in 1939.

Using 1937 as the year for comparison, the industry has a closer approximation to the conditions which defense will bring, although defense demands on the pulp and paper industry will probably exceed the 1937 figures when the program gets fully under way.

The demands on the pulp and paper industry probably will reach a new high level when defense is in full swing, for coupled with all the various elements of the regular defense uses of paper, such as containers for shells, commercial containers, wrapping papers, and similar common uses, there will be the various new specialty uses, and an extensive use of papers in the construction field where pulp and paper products in the board fields are in many cases replacing lumber.

Furthermore, even such centralized production as the giant bombers which are being rushed to completion along with thousands of other types of planes, must be supplied by plants located throughout the country, and the wrappings and containers required in assembling parts and final shipment of the completed plane will constitute a bulkload on the industry.

Products from as many as thirty states go into these bombers, and this same condition is repeated in many other defense items.

In the field of shipping and wrapping papers, and of fiber containers, the Defense Commission is not greatly concerned over sources of supply. While the European sources of raw material for kraft pulp have been cut off, the domestic supply would probably be adequate, provided that careful scheduling of production were instituted within the industry.

With proper planning within the industry, the expected requirements for kraft products undoubtedly can be met, and the machines for producing both kraft liners and the regular kraft wrapping stock are also competent to carry the load without too much addition.

As for the supply of waste papers for paperboard used extensively in containers of all kinds, this supply actually has never been fully exploited, and is held to be adequate for the needs of any expected market.

Normal waste paper consumption is approximately four and a quarter million tons annually, of which by far the greater proportion goes into the manufacture of paperboard. In this field the normal annual consumption is three and three-quarter million tons. Book papers using waste papers as a substitute for soda pulp, require approximately a half million tons of waste papers a year.

While there is no exact estimate of the availability of waste papers in this country, it is obvious that a great portion of the available used paper remains uncollected. The problem in this field is inherent in the nature of the product.

Waste paper is mostly bulk tonnage of a relatively low economic value. Mills which use this product must of necessity be located close to the source of waste paper supply on two counts. The first is that the low value of the material cannot stand any considerable hauling charge, and the second is the fact that the source of waste paper supply is also the chief distributing center for the finished products of the industry.

Because of the nature of the waste paper industry, prices fluctuate on an extremely volatile market, and are unpredictable. A stable market and a firm price are necessary to insure a steady and thorough collection of the product in larger quantities than are now collected. Under such conditions it is estimated that the annual yield of waste papers could be increased from four and a quarter million tons

to approximately six and a half million tons.

Products made of kraft and waste papers complement each other in many important uses, and with the undoubtedly large increase in consumption of the corrugated box, both these products will greatly increase in use. As neither product is an immediate source of worry as far as supply is concerned, the Defense Commission is merely maintaining a close check over general trends in the industry.

In as diversified an industry as the pulp and paper industry, every development must be watched closely. Whereas there may be an ample supply of a particular pulp under existing industrial practice, a new development in industry may well raid a particular branch of the industry. It is conceivable that sudden demands might disrupt operating and price schedules. Such developments are under the close scrutiny of the Defense Commission.

But these are problems of control. In the regular trade practices of the industry such controls would be exercised by the trade itself, with certain economic laws coming into play to stabilize the industry.

In National Defense preparations, the Government will step into the picture to provide a measure of balance and control. It is generally recognized that the National Defense Commission as at present constituted has not reached its final form. While it is generally referred to as the Defense Commission, the Commission phase of the defense body has not yet come into play. The Defense Commission has in fact acted only as a council, and the actual powers have been vested in the President of the United States.

Only the outlines of the Defense Commission are accurate, and these were suggested primarily by the World War Industries Board and the Priorities Board that functioned at that time. Certain refinements over the last war control boards have appeared, but the Priorities Board which has been formed under the present Commission closely resembles the World War board.

The point of difference is the lack of power of the present Priorities Board. This lack of power probably will be remedied within a short period of time when and if the emergency progresses. It has been the general policy of the President to add only such control measures and policies to the powers of the Defense Commission as the interests of defense demand.

From these indications it is apparent that while the Defense Commission has not acted to maintain a balance of production in the pulp and paper industry, it is only because such control measures have not as yet become necessary.

It is also indicated that if it does become necessary, the Priorities Board will be empowered to control not only priorities in the field of manufactured goods, but also priorities of raw materials. Such powers could affect the pulp and paper industry to an extent where the Defense Commission could apportion certain types of pulp to particular mills, and in this fashion exercise a stringent control over the industry, were it necessary in the interests of national defense.

This control might be one of forceful persuasion, which often was exercised during the World War. At that time, there was a shortage of freight hauling facilities, and the Priorities Board used this factor as a lever to gain co-operation from industry generally. In the pulp and paper field, there was a shortage of chlorine, and this essential bleaching agent was an effective persuader.

Such stringent control measures are a far cry from the earliest control element exercised in the United States and affecting the pulp and paper industry.

When the industry was still dependent on rags in the early Colonial days, there was enacted the first control legislation affecting the industry. The Second Congress of the United States considered the rag supply such an important matter that it passed a resolution calling on the people for enough rags to keep the industry going.

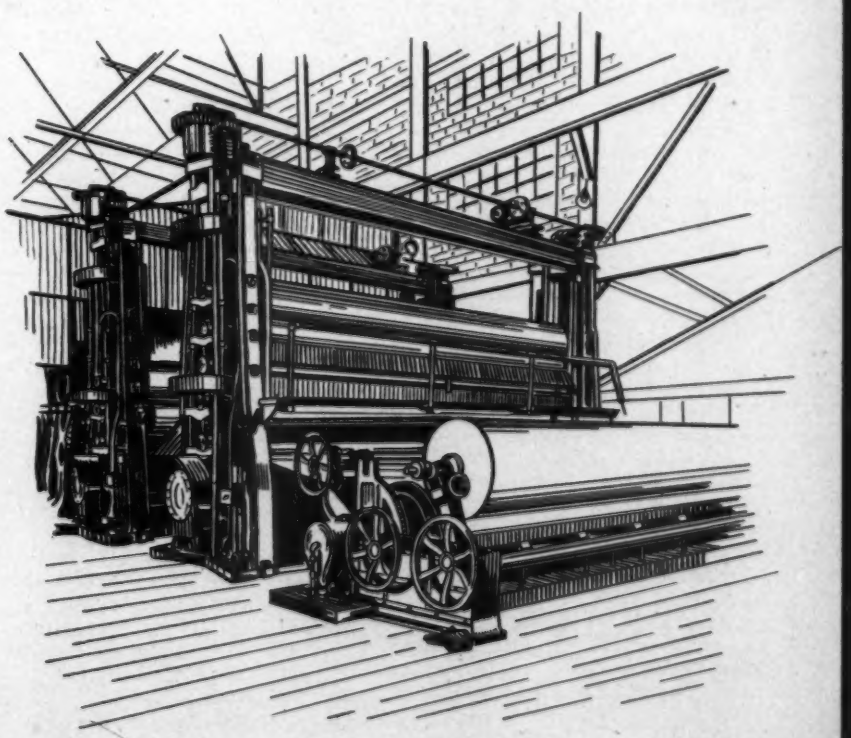
While the industry is no longer dependent on the rag collections of the Colonial days, the raw material supply for pulp is still the strategic factor, and it is in this phase of the industry that possible control measures will develop.

In addition to kraft papers and waste papers, newsprint is another phase of the industry which is not considered in any serious danger of shortage. With Canada as the major source of newsprint, and in view of close economic and friendship bonds which exists between the United States and Canada, there is no feeling of apprehension as to this source of supply.

Even under present heavy demands, there is still a substantial excess of capacity in the Canadian newsprint industry.

There has been some consideration given to a possibility of higher costs in the newsprint field, but there appears to be no immediate likelihood of such an increase. Canadian mills have taken into consideration the long range attitude that a rising price in Canadian newsprint might be a form of subsidy to the still infant southern newsprint industry. While the southern newsprint is not now considered a threat, it is believable that a sharp upward trend of Canadian prices would foster an expansion of the southern industry.

Another factor in the maintenance of a steady price level in Canadian



newsprint has been the fact that while labor and transportation costs have undoubtedly gone up in Canada, the devaluation of the Canadian dollar has taken care of such increased costs, and the Canadian industry has been operating on an even keel. Moreover, volume of production is vitally important to Canadian producers.

It is, then, in the sulphate and sulphite pulp fields that the problem develops. In the sulphate field, a large tonnage of the better grade pulps came into this country from European sources, and many mills which were dependent on these sources for their supply of pulp must now look to domestic and Canadian production.

Again, there is no question of a lack of pulpwood for this type of pulp. Its supply is adequate and abundant, and with careful organization could be utilized without too great a depletion of American reserves.

The principal problem is the inadequacy of pulp-making plant facilities to make up for normal European supplies, and this problem is of major magnitude. The pulp and paper industry has a very high investment ratio in the comparison of the plant investment to the annual per dollar value of the manufactured product. For every dollar of primary product manufactured each year, a dollar of investment in plant is required.

This investment ratio is much higher than in such industries as leather, food, textiles, printing and rubber industries. This means that the cost of carrying idle equipment is exceptionally high. The basic result of this high investment ratio is that the pulp and paper industry can much less afford to launch an expansion program than any of the other industries mentioned, unless permanent markets are pretty well assured.

While other industries can expand their facilities under ordinary business risk conditions, the pulp and paper industry must have a greater certainty of future profitable operation to warrant a large plant investment.

There is little tendency in the industry to expand without an assured market, and there may even develop opposition to government subsidized expansion of the industry on the grounds that a long range view of the industry does not justify expansion for immediate needs if the industry can handle defense requirements without expansion.

The pulp and paper industry is fully aware of the possible demands on the industry due to defense preparation. The curve of paper usage in industry during a sharp upward spiral of business conditions is much sharper in the upward trend than the curve for general industry, for while industry moves on a broad front, the usage of pulp and paper multiplies in every phase of industry.

To illustrate this factor, a manufacturing concern operating in a period of business expansion will naturally increase operations. Production of regular items will increase, and possibly new items will be added to the production schedule.

However, the expansion of this plant will place a much heavier proportionate demand on the paper industry than any other material. First of all, it is probable that some form of paper product is used in the direct process of manufacture, and the use of this product will naturally increase in use along with other materials.

In the paper field, increased business means an increase in office correspondence, business forms, office memoranda, requisitions, job jackets and other plant control forms. Further, increased business generally leads to an increase in advertising literature, catalogues, and general advertising in magazines and newspapers. Finally, in shipment of goods, the operations of the expanding plant will require additional wrapping and shipping papers, and containers.

The armament bulge on the pulp and paper industry is multiplied first, by the direct needs of the armament industry for papers, and then in the second phase of industrial expansion, by the actual increased usage of such papers by manufacturing units supplying civilian needs which have been created by increased consumer purchasing power.

Possibly the defense impact on the industry would not be as direct could it be spaced over a longer period of time. But, defense is a rush job. The armaments industry must be expanded. New industries must be created, and along with these demands, homes for defense workers must be built in such numbers as have never been undertaken before in this country.

And in all of these fields, usage of paper and paper products has been increased to the point that each phase of industry is bound up in some phase of paper production.

To meet the immediate needs of peak defense demands, there will be a great deal of pressure for new plant construction, but there are two additional factors that would discourage such expansion. These are taxes and increased labor costs. In the field of taxes, the government policy as announced is to increase taxes only to meet the present operating deficit.

To pay for the defense expenditure, the Government plans to increase the debt, possibly raising a large sum through popular subscription to a defense bond issue. These bonds would be sold in nation-wide patriotic drives similar to those of the World War.

The effect of such borrowing would not become apparent immediately, but an increased national debt of between fifteen and twenty billion dollars for national defense, does not present an encouraging picture for an industry which has such a large investment ratio.

Another deterrent to plant expansion is the high salary and labor ratio of the pulp and paper industry. The industry employs more experts than seven other major United States industries.

In addition, the labor employed in the industry has a very high proportion of skilled labor, and technicians and skilled labor are at a premium during defense preparation. A major problem would be to maintain a steady labor unit at each plant, and the construction of additional plant facilities might create a condition where one plant bid against another for labor supply, both plants requiring the additional labor to meet defense requirements.

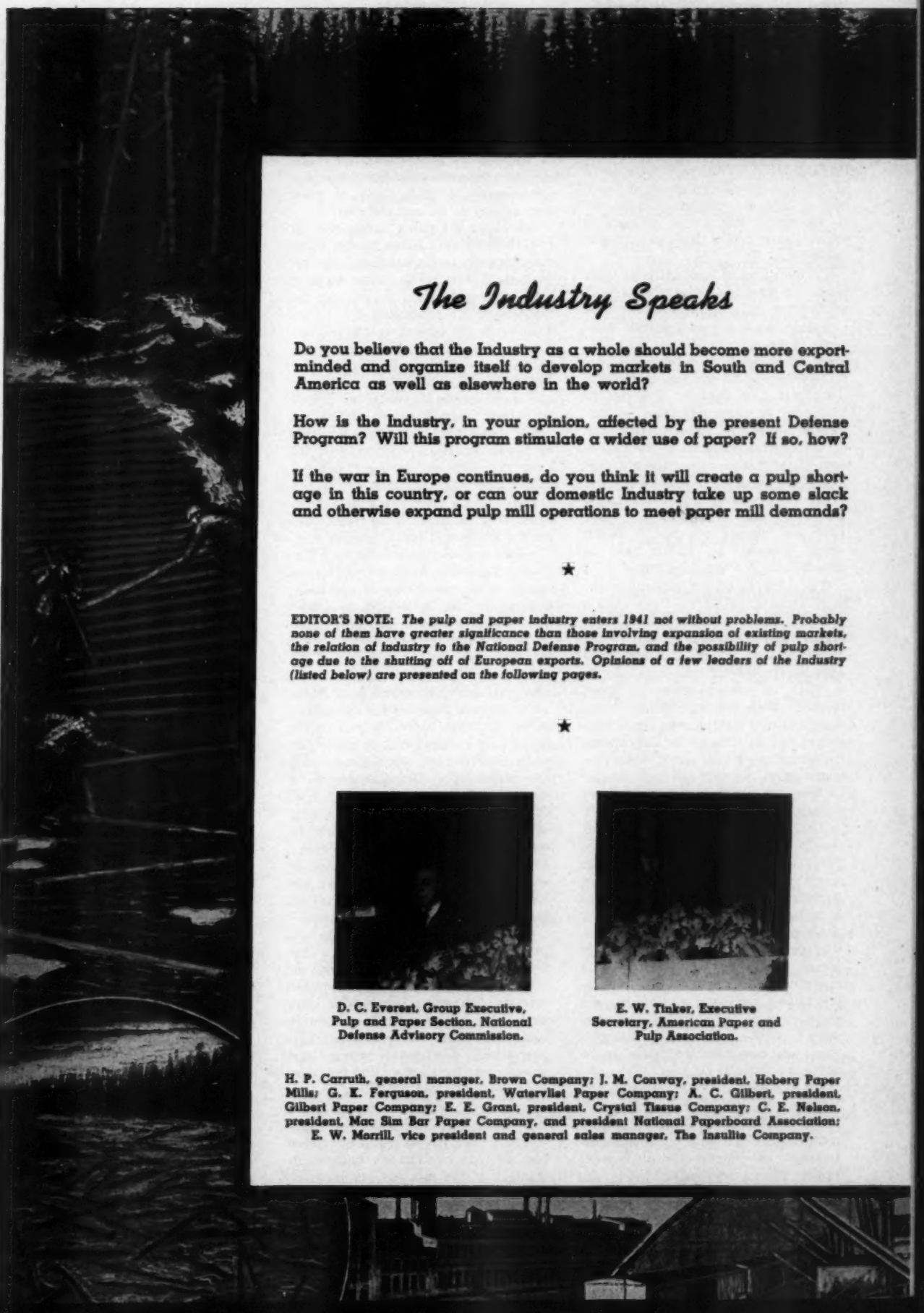
Here, again, there appears the problem of control, and the suggestion has been made that there might be inaugurated a priorities control of labor to function so that vital industries would not be in danger of losing trained employees and skilled workmen.

It has been suggested that the industry may oppose either new plant construction by the Government or RFC loans for new plant construction. In the instance of government plant construction, it is felt that under the five-year lease plan (under which the Government builds a plant and leases it for a period of five years), that plant expansion might get out of hand.

Under the plan, the Government at the end of five years gives the lessee the right to purchase the plant, after agreeing on the depreciated value of the plant. This might give the plant leasee the opportunity to purchase a plant at a price far below reproduction value, and in this way upset the entire industry.

It has been made apparent that it is up to the industry itself to protect its long range interests, as the President, Congress, and members of the Defense Commission are not as concerned with long range effects on industry as much as the immediate needs of defense.

Industry must co-operate in this effort. However, leaders in the industry must guide their course, and combine what is best for their industry with the needs of the defense of the nation.



The Industry Speaks

Do you believe that the Industry as a whole should become more export-minded and organize itself to develop markets in South and Central America as well as elsewhere in the world?

How is the Industry, in your opinion, affected by the present Defense Program? Will this program stimulate a wider use of paper? If so, how?

If the war in Europe continues, do you think it will create a pulp shortage in this country, or can our domestic Industry take up some slack and otherwise expand pulp mill operations to meet paper mill demands?

★

EDITOR'S NOTE: ***The pulp and paper industry enters 1941 not without problems. Probably none of them have greater significance than those involving expansion of existing markets, the relation of industry to the National Defense Program, and the possibility of pulp shortage due to the shutting off of European exports. Opinions of a few leaders of the industry (listed below) are presented on the following pages.***

★

D. C. Everest, Group Executive, Pulp and Paper Section, National Defense Advisory Commission.

E. W. Tinker, Executive Secretary, American Paper and Pulp Association.

H. P. Carruth, general manager, Brown Company; J. M. Conway, president, Hoberg Paper Mills; G. K. Ferguson, president, Watervliet Paper Company; A. C. Gilbert, president, Gilbert Paper Company; E. E. Grant, president, Crystal Tissue Company; C. E. Nelson, president, Mac Sim Bar Paper Company, and president National Paperboard Association; E. W. Morrill, vice president and general sales manager, The Insulite Company.

"the industry will undoubtedly meet a severe test in 1941"

D. C. Everest

Group Executive, Pulp and Paper Section
National Defense Advisory Commission

▶▶▶ THAT THE PULP AND PAPER INDUSTRY will share fully in the anticipated expansion of business in 1941 is a foregone conclusion. A substantial increase in production seems likely in the light of present prospects.

The estimates of production in 1940 indicate a total for the year of around 14,250,000 tons, some 750,000 tons greater than any previous record. Estimates of possible production in 1941, based upon past relationships with general business levels and trends, indicate that at least a ten per cent rise in 1941 can be expected. This is contingent, of course, upon continuation of the general business revival that is now under way, a circumstance that is likely in view of the National Defense Program. In tonnage, such an increase would amount to around 1,500,000 tons, the greater portion of which would probably be in the field of paperboards and wrapping papers.

The addition of this amount to the high level achieved in 1940 should give the industry an operating ratio higher than any former record over a year's period. There will not be a substantial increase in new capacity in 1941, if present indications prove correct. Under the urge of high operating ratios, some speeding up of machines can be expected. But permanent increases which entail much new construction are not so likely because of the probable delay in the delivery of new equipment.

The narrowing of the margin between capacity and production levels, likely to take place in 1941, poses many problems before the industry, important among which is price. This is particularly important because present paper prices do not reflect the current costs of wood pulp. Some increases are to be expected; they are urgently needed by the mills that depend upon purchased wood pulp. But the movement, once started, can easily carry beyond essential needs, for merchant and consumer stocks are generally considered to be low.

Price movements are of particular concern in the Defense Program. Every effort is being made by governmental agencies to impress upon manufacturers the importance of keeping prices within reasonable limits not only from the point of view of government purchases, but also from the general economic viewpoint. Runaway prices could cause irreparable havoc to the present program and to the general economic welfare.

Industrialists generally understand the situation and they are co-operating thoroughly with governmental agencies. In fact, no official action has as yet become necessary, chiefly because of this co-operation. This does not mean, however, that the Government is not prepared to take action if price rises appear to be unreasonable.

An expanded paper production in 1941 will throw a heavy burden upon the domestic and Canadian pulp industries. Undoubtedly, some increase over 1940 production records can be expected; but it is unlikely that all requirements can be met in the qualities desired. The huge inventories of wood pulp that were piled up early in 1940 have been seriously depleted and more and more consuming mills are forced to depend entirely upon current recepits. The tonnages made available by North American producers in 1940 were not sufficient to meet requirements then. The situation in 1941 is apt to be much more stringent, for demand will undoubtedly be greater and reserve stocks will be far smaller.

There is in the pulp industry a surprising flexibility, however, and under forced draft conditions of operation, production can be shifted to grades most urgently needed, and output can be stepped up considerably with some sacrifice in quality.

In many consuming mills, there is also great flexibility which permits the substitution of bleached for unbleached pulps, of waste paper for part of the wood pulp requirements in many furnishes, and even of groundwood pulp for chemical pulps in some grades. It is generally felt that by forced draft operation of pulp mills and by substitution of one kind or another, requirements will be met. Moreover, some increase in pulp-making capacity will come into operation in 1941, not much on a percentage basis, to be sure, but a significant amount in tonnage.

Contract prices for wood pulp will probably remain stabilized for a considerable period in accordance with the informal agreement between manufacturers and the Price Stabilization Division of the National Defense Commission. Significant cost increases might change this situation; however, they would more likely affect first the paper prices of integrated mills.

In spite of the fact that no one knows how much pulp and paper the industry can produce when put to an extreme test, analyses of available statistics indicate that the margins are relatively narrow all the way around. Even though the Defense Program is largely concerned with durable goods with which paper is not so closely associated, the reflection back into consumer goods is bound to be quick and positive. A huge increase in paper consumption could easily result, which would strain every section of the industry.

But more certain than that is the possibility of temporary strain periods, during which demand overruns producing capacity, as it did in the last quarter of 1939. Such periods are certain to develop speculation waves, violent price fluctuations, and strained customer relationships. It is in handling such situations that the industry will undoubtedly meet a severe test in 1941, the pulp and paper industry and many other basic American industries. To a surprising extent, the whole future of American industry depends upon how well these tests are met.

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"the paper and pulp industry should give serious consideration to employee training programs"

E. W. Tinker

Executive Secretary
American Paper and Pulp Association

▶▶▶ THE NATIONAL DEFENSE PROGRAM seems to be having different effects on paper and pulp mills in various sections of the country. Mills in the Middle West, for example, have lost practically no employees to the defense industries while in the East, especially around large industrial centers, a number of workers have transferred.

It is interesting to note, moreover, that skilled workers do not seem to be the ones attracted by the defense jobs. Most of the industry's skilled men have been with their companies for many years, are already working at high wages, and have considerable stakes in their seniority rights. Furthermore, many of such workers have bought homes and are well settled in their respective communities. The defense jobs, therefore, appear more attractive to the younger men working at semi-skilled occupations, or as apprentices or helpers on skilled operations. This is the group of workers with which the industry should be primarily concerned.

In order to prepare for the time when serious labor losses may occur, several well-known companies in the industry have made detailed inventories of their working forces. These surveys show the skills and experiences of each worker and indicate which employees are ready for promotion should certain

jobs be vacated by men transferring to the defense industries. Some mills have even made or obtained from the United States Employment Service, surveys of the skilled and semi-skilled unemployed in their localities. Finally, a number of companies have tried to determine which workers may be drafted for military training and how their jobs will be filled while they are away.

. . . it appears that the paper and pulp industry should give serious consideration to employee training programs if it is to protect itself from the general labor shortages which are now developing.

◆

"Nobody . . . can predict the economic repercussions that seem inevitable when our defense program ceases"

J. M. Conway

President, Hoberg Paper Mills

▶▶▶ THE FUTURE OF the pulp and paper industry would be one of uncertainty if we were to return to free imports on pulp during the post-war period.

If this country is determined to maintain its standard of living, it can only do so by preservation of its industries. The present information is to the effect that the United States and Canada are qualified to produce the necessary pulp and paper requirements of the North American continent.

It seems to me that unless production capacities in the pulp and paper industry are increased in the United States and Canada, there would be very little exportable pulp or paper to South American markets, and it is doubtful whether or not we should cultivate this market, because their natural trade area is the European countries who can take merchandise instead of gold.

After the war, competition might be very severe for this South American trade and might be prohibitive with our standard of living, and a needless consumption of our forest reserves.

We shouldn't become unduly alarmed about the sudden increase in demand for pulp and paper. Such is usually the case in times of stress or war, which usually is brought about by speculations and fear of shortages or inflation. My feeling is, over a period of time, even during war times, that the normal consumption will not enhance materially.

We predict that the paper industry will continue to maintain volume, at least, for the period that our defense program maintains and the European war continues.

Nobody, in our opinion, can predict the economic repercussions that seem inevitable when our defense program ceases and the war terminates.

◆

"a situation which will require more usage of all types of paper"

E. E. Grant

President, Crystal Tissue Company

▶▶▶ IT IS OUR OPINION that the industry as a whole will not become export-minded, as we believe that immediately following any peace activities abroad, the South and Central American countries will be deluged with a quantity of very cheap paper.

Our company, as far as its branch of the industry is concerned, has not been affected by the present Defense Program, but we do believe that the Defense Program when it gets under full swing will necessarily produce a situation which will require more usage of all types of paper, and we hope to get our share of this business.

We have used some foreign raw material, but regardless of whether or not the European war continues, we now believe that the American mills would do well to stay with domestic suppliers and should show a reticence following negotiations to go back on any basis nearly approaching that of the pre-war period. After all, we have our own country's problems to look out for, and with the increased taxation which all of us must bear, it is only sensible to support American industries so that more industries will flourish and therefore the tax burden will be spread more widely and will not have a damaging effect upon any one company.

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"The industry is very definitely affected by the Defense Program"

A. C. Gilbert

President, Gilbert Paper Company

▶▶▶ MY ANSWERS ARE BASED on the Rag Content field in the paper business, which is a very small field.

I believe that the paper business will be extremely good for the year 1941, particularly for the first six months of that year.

In reply to specific questions I believe that the industry as a whole should become very much more export minded and do everything it can to develop business in South and Central America, as well as elsewhere in the world. The export business has been going, of course, to the lower grades of paper, but there is a very considerable volume of business on high grade papers, even up to 100 per cent rag, and the tendency, of course, is strongly away in foreign buying from English and European papers to South American and United States production.

The industry is very definitely affected by the Defense Program for the reason that government purchases are very much larger than in the immediate past. For instance, it is anticipated that for the first six months of 1941 the government will use 25 per cent of the total production of the rag content mills. Then as the expenditures for defense purposes filter down through the consumer business will increase, and all of this will require a wider use of paper.

If the war continues in Europe, I believe there will be some tendency toward a pulp shortage, but the expansion of pulp mill operations is being made and I think will eventually meet all paper mill demands.

◆

"tight situation as between supply and demand for pulp"

H. P. Carruth

General Manager, The Brown Company

▶▶▶ IT IS A FACT that the course of hostilities abroad will probably have a considerable effect upon the pulp and paper business and that, as this matter is not determinable, any attempt to forecast the future must rest upon an assumption of substantially the same conditions as at the present time, although it is my opinion that even a cessation of hostilities would be slow in changing the outlook.

The fundamental factors in the outlook for the new year of principal significance to our industry are:

(1) The rise in the level of general domestic business certain to accompany the growing defense program, and thus create the strongest general market within the confines of the United States which has existed in many years and, in fact, probably the highest of all time.

(2) The practical elimination of imports of pulp and paper from the Scandinavian countries.

(3) The present dependence of considerable portions of the world outside North America upon North American

pulp supplies and, to a lesser degree, paper supplies. It is my opinion that the interrelationship of these factors will result in extremely strong markets for our industry in the months ahead, and that prices in all divisions will adjust themselves to these conditions.

Up until the present time, the full effect of the cessation of imports of Scandinavian pulps has not been felt because of the extremely high rate of such importations in the first four months of the war, which, coupled with a desire on the part of paper buyers to protect supplies by contracting with North American producers, resulted in a slow liquidation of accumulated stocks of pulp. The consumption of these stocks has, however, been proceeding at a fairly regular rate since last February, and the trends indicate that they will be reduced to minimum quantities some time early in the coming year. The effect of this situation will be to put all paper manufacturing units on an equality as to pulp costs and will therefore act as an equalizing factor on paper prices.

While I foresee a tight situation as between supply and demand for pulp, I do not believe that there is danger of a shortage in the sense that there will be any difficulty in meeting the requirements for suitable paper throughout the market. Adjustments in quality and other factors, such as basis weight, may be necessary. These can be accomplished readily without dislocation.

◆

"plan our operations on the firm foundation of facts"

C. E. Nelson

President, Mac Sim Bar Paper Company
President, National Paperboard Ass'n

▶▶▶ SPEAKING AS AN INDIVIDUAL, I think that planning by the individual mill and planning by the paperboard industry as a whole, from now on, must be co-ordinated with the general defense program of our nation, insofar as is humanly possible.

We must be sure of our facts and, having the facts, we of the paperboard industry should be sufficiently intelligent to plan our operations on the firm foundation of facts—not upon the sands of guesswork.

We are today fortunate in that there exists no shortage of raw materials used in the manufacture of paperboard; it is equally true that no extreme shortage of any of the major ingredients is expected in the near future.

Today there is certainly no occasion for anybody, governmental or private, to initiate or agitate any shortage scares. Our statistics clearly show that the manufacturing capacity of the paperboard industry is more than ample to supply the expected demand, both domestic and foreign.

My advice to the men of the paperboard industry is that they meet regularly, secure the other fellows' views and through common council and exchange of experiences, keep informed as to what our industry is doing, and also as to any changing situations affecting the foreign and the domestic picture.

In the paperboard industry, we have the National Paperboard Association which is so organized and managed that it can act swiftly for our industry in anticipating and in meeting problems as they arise.

If anyone can suggest a better way for doing our job and meeting our obligations to our country, our customers, our employees, and our stockholders, I shall welcome his advice.

◆

"our plans for the future have been reduced to the status of blind guesses"

G. K. Ferguson

President, Watervliet Paper Company

▶▶▶ GENERALLY SPEAKING, we expect that business will be better during the early part of the coming year, but we can recite no facts as a sound basis for such a statement.

It is premised almost entirely on the thought that if business is better generally, the paper industry will receive finally some impetus, although you may know that the demand for printing paper usually lags behind the regular business cycle.

As to the export market, we are inclined not to get excited about the possibilities for the simple reason that the demand may be of limited duration, limited to the extent that the war in Europe interferes with shipment. Our basic economies will not permit us to compete successfully with other nations, once anything like normal relations are established.

From our limited viewpoint, we do not see anything which will cause a pulp shortage in the immediate future.

A year or eighteen months from now we may be facing an entirely new combination of circumstances.

The best thing, perhaps, I can say is that we feel our plans for the future have been reduced to the status of blind guesses.

"Defense appropriations for construction already exceed $2,000,000,000"

E. W. Morrill

Vice President and General Sales Manager
The Insulite Company

▶▶▶ THE YEAR 1941, according to latest authoritative opinion, will undoubtedly be one of the biggest building years in American history. In fact, it may turn out to be the largest building year of all.

Most of the increased building activity during 1941 will be provided by projects both directly and indirectly associated with the National Defense Program. This program, though launched only a few months ago, is now well on its way on a gigantic scale in every part of the United States. Canada has been carrying on a somewhat similar national defense program ever since its declaration of war against Germany over a year ago.

Uncle Sam is determined to assemble a million or more men for training in all essential branches of the nation's military service between now and the middle of 1941. However, these men can be called into service only as fast as the best of accommodations can be provided.

Defense appropriations for construction already exceed $2,000,000,000. Most of 1941's public engineering and building work will be for navy, army, and air corps defense industries, and for defense housing.

Although increased industrial production resulting from the greatly enlarged public and private building program is certain to increase the consumption of both producers and consumers goods in 1941, most concerns whose business is increasing will rely upon previously unused capacity in filling their orders rather than upon enlarged capacity. Thus most commercial building will concern itself with the erection of additions to old plants and modernization programs rather than with the construction of large new plants.

Some have expressed the fear that construction industry facilities may not prove adequate to carry on such an enlarged program of public and private construction as confronts the nation during the coming months. However, since industry has not been employed to capacity for many years, it seems improbable that it will find it difficult to handle the work ahead. Though temporary shortages of material and skilled labor may develop, here or there, these are unlikely to continue long.

Brown Mechanical Pulp from Yellow Birch

MYRON KIN[1] and C. E. LIBBY[2]

An abstract of a thesis submitted in partial fulfillment of the requirements of the New York State College of Forestry, Syracuse, New York, for the degree of Master of Science in 1938. Literature citations of work done after that date are not included.

PART III—DISCUSSION

▶▶▶ THE RESULTS PRESENTED in Table 1 and Figure 6 compare cooks made by boiling wood at atmospheric pressure with cooks steamed under 25 pounds pressure. Both give fairly smooth curves for total solids, soluble solids, and ash. The total solids from the boiling treatment seemed to decrease in practically a constant amount as the time of cooking increased. The ash was practically constant at all times for the boiled wood. On steaming wood, the opposite result was obtained, for as time of cooking increased, the total and soluble solids increased in almost direct proportion. The ash, however, remained practically constant up to 10 hours, doubled at 15 hours, and was almost six times as great at 20 hours.

ANALYSIS OF LIQUOR EXTRACTS

Total Solids and Ash

The effect of increasing the pressure of steaming is shown by Figure 7, and indicates the marked influence of increasing the pressure and time of cooking on the total and soluble solids and ash. Up to 10 hours, the increase was not very marked, but above 10 hours the total solids, soluble solids, and ash were increased very decidedly. For a 20-hour cook, the total solids obtained at 50 pounds cooking pressure were 10 times that at 25 pounds pressure and the ash was almost five times that at 25 pounds pressure.

Tannins

The amount of tannins from the boiling cooks (Figure 8) remained constant up to 10 hours and then decreased with increased time of cooking. The steaming cooks gave only about one-half the amount of tannins as the boiling cooks up to 10 hours of cooking, but then increased rapidly. After about 13 hours of treatment, both boiling and steaming at 25 pounds pressure, resulted in the same amount of tannins.

Increasing the pressure of steaming, as shown in Figure 9, seemed to have no appreciable effect on the amount of tannins until after 10 hours of treatment. In the 15 and 20 hours of steaming at 50 pounds pressure, the amount of tannins in the liquor extract increased very rapidly.

COLOR ANALYSIS OF WOOD SAMPLES

The wood samples from all cooks (Table 2) seemed to be low in the shorter wave length colors (violet and blue) and high in the longer wave length colors (yellow, orange, and red).

In Figure 10 comparative curves were drawn for the wood samples treated by boiling at atmospheric pressure for different lengths of time. The curve marked No. 0 was a color analysis of an untreated wood sample. The wood darkens as the time of cooking is increased. Curves No. 1 and No. 21 represent the color of wood treated for five hours. Cook No. 21 was made in a stainless steel digester where the temperature was not as high as in Cook No. 1, and as a result shows a slightly better color.

Figure 11 represents the color of wood when steamed for different lengths of time at 25 pounds pressure. Here, as would be expected, a greater darkening of color occurs than from the boiling treatments. The cooks run for periods of 10, 15, and 20 hours indicated quite a lowering in color, while steaming and boiling for five hours gave practically the same darkening in color.

Increasing the pressure of steaming to 50 pounds resulted in a constant darkening in color as the time of cooking increased (Figure 12). The color curves for all cooks at 50 pounds pressure were lower than the darkest of either the boiling or steaming curves. In fact the 20-hour cooks of the 50 pounds pressure series resulted in a slight charring of the wood, giving off a very noticeable odor of burnt sugar.

Figure 13 represents the color curves of wood samples from cooks in which some chemical was used. In two instances the color of wood was improved over that of the untreated sample by the use of 2 to 3 per cent of zinc hydrosulphite. Curve No. 3 indicates the effect of steaming with sulphur dioxide gas. The resulting wood was of a very dark red or mahogany color. It was very soft, tending to crumble in the hand. Evidently extensive pulping resulted, and the wood was probably degraded by acids formed during the cooking operations. When ammonia gas was used simultaneously with the sulphur dioxide gas, the color was improved greatly as is evidenced by Curves No. 8 and No. 9, although the cooked wood was still somewhat darker than the untreated wood.

The zinc hydrosulphite seemed to have the greatest effect in retarding the darkening of the wood. No color curves could be obtained that would check absolutely with other curves on cooks run under identical conditions, due probably to the variable characteristics of the wood, such as heartwood content, age, and exposure to weather.

GRINDING OF WOOD

Power Consumption

In the first series of grinding runs (Table 4) tests were made using 60 pounds per square inch cylinder pressure with the stone surface sharp. The resulting power consumption per ton was very low, averaging between 20 and 27

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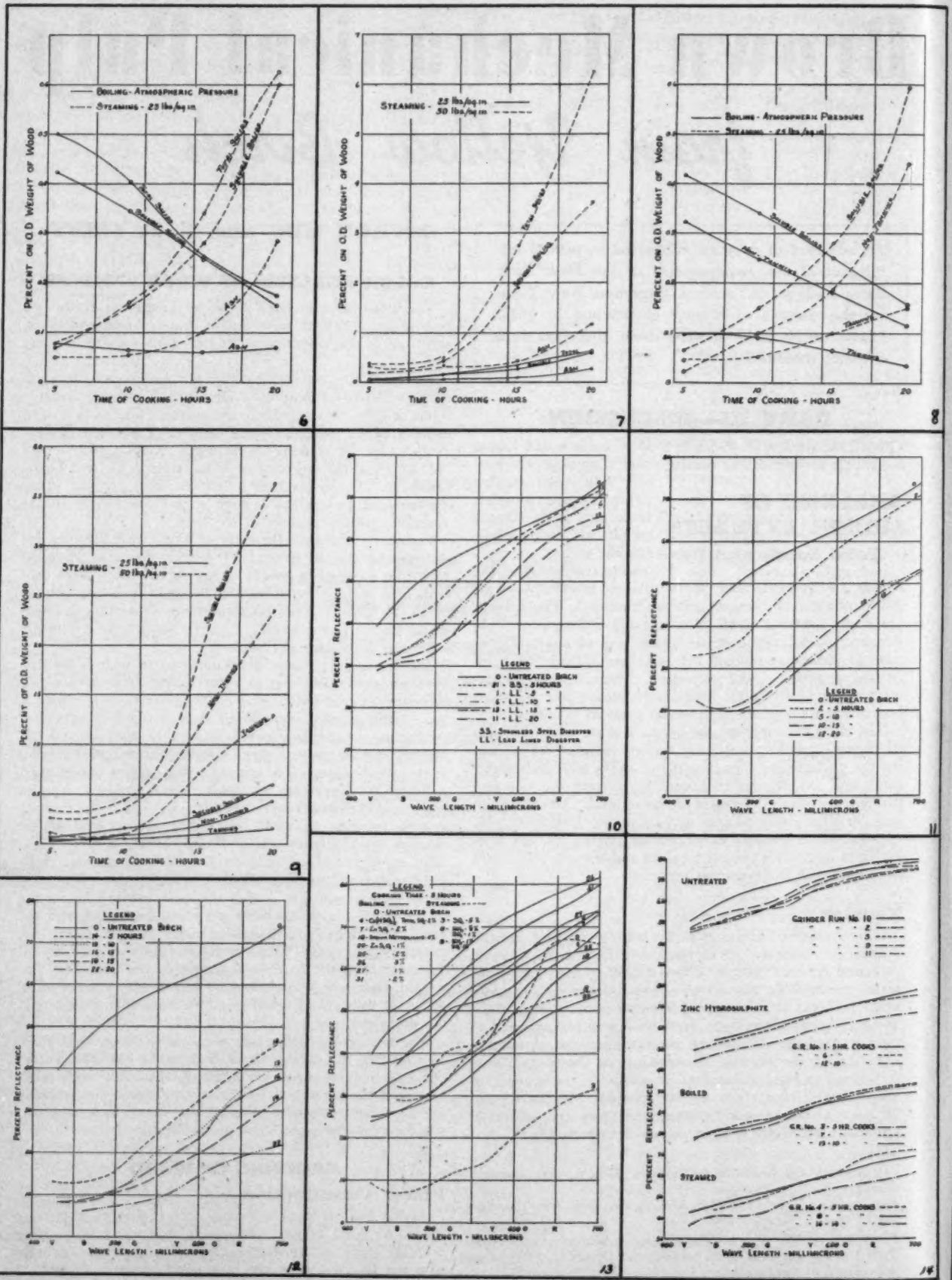
EDITOR'S NOTE: This is the concluding installment of this article. Parts I and II appeared in the October and December, 1940 issues, respectively, of this magazine.


Boiling - Atmospheric Pressure
Steaming - 25 lbs./sq.in.
Percent on O.D. Weight of Wood
Time of Cooking - Hours
6
Steaming - 25 lbs./sq.in.
50 lbs./sq.in.
Percent on O.D. Weight of Wood
Time of Cooking - Hours
7
Boiling - Atmospheric Pressure
Steaming - 25 lbs./sq.in.
Percent on O.D. Weight of Wood
Time of Cooking - Hours
8
Steaming - 25 lbs./sq.in.
50 lbs./sq.in.
Percent of O.D. Weight of Wood
Time of Cooking - Hours
9
Percent Reflectance
Legend
0 - Untreated Birch
SS - Stainless Steel Digester
LL - Lead Lined Digester
Wave Length - Millimicrons
10
Percent Reflectance
Legend
0 - Untreated Birch
Wave Length - Millimicrons
11
Legend
0 - Untreated Birch
Percent Reflectance
Wave Length - Millimicrons
12
Legend
Cooking Time - 5 Hours
Boiling
Steaming
0 - Untreated Birch
Percent Reflectance
Wave Length - Millimicrons
13
Untreated
Grinder Run No. 10
Zinc Hydrosulphite
Boiled
Steamed
Percent Reflectance
Wave Length - Millimicrons
14

Captions—Page 1044

Fig. 6—Effect of time of treatment of wood on the total and soluble solids, and ash of the liquor extracts.

Fig. 7—Effect of steaming of the wood at 25 and 50 lb. pressure on the total and soluble solids, and ash of the liquor extracts.

Fig. 8—Effect of time of treatment of wood on the soluble solids, non-tannins, and tannins of the liquor extracts.

Fig. 9—Effect of steaming of the wood at 25 and 50 lb. pressure on the soluble solids, non-tannins, and tannins of the liquor extracts.

Fig. 10—Effect of boiling at atmospheric pressure upon the reflectance curves of the wood.

Fig. 11—Effect of steaming at 25 lb. pressure in the lead-lined digester upon the reflectance curves of the wood.

Fig. 12—Effect of steaming at 50 lb. pressure in the lead-lined digester upon the reflectance curves of the wood.

Fig. 13—Effect of treating wood with chemicals upon the reflectance curves of the wood.

Fig. 14—Reflectance curves of treated groundwood pulps.

horsepower-days per ton (Figure 15). The untreated wood consumed the most power, contrary to the general belief in regard to the grinding of treated wood. The boiled wood required the least amount of power, averaging about 19 per cent less energy consumption than the untreated wood. The zinc-treated and the steamed wood consumed about the same amount of power, this being about eight per cent less than the untreated wood.

In the next series of grinder runs, the stone was dulled and the cylinder pressure was reduced to 40 pounds (Figure 15). Two runs were made on untreated wood under these conditions. The wood bound so much in the grinder pockets in the first of these runs that a second run was made. The power consumption in the first run was rather high, but the second run was more in accordance with expectations. The zinc-treated wood consumed the most power in this series of grinder runs, requiring about 59 per cent more than the untreated wood. The steamed wood was next in order, requiring about 43 per cent more than the untreated, while the boiled wood consumed about 31 per cent more.

The power consumption compared favorably with the general average values for commercial newsprint groundwood, which is around 60 horsepower-days per ton. However, it was deemed advisable to lower the cylinder pressure to 20 pounds using the same stone surface (Figure 15). In this run, the wood cooks were for 10 hours instead of five hours, since it was thought that the wood did not receive enough treatment in five hours to produce any appreciable differences in grinding characteristics. Also in this run untreated spruce was ground for comparative purposes. The untreated spruce consumed about 10 per cent more power than the untreated yellow birch. This was to be expected since birch wood is so much more dense that, although it grinds more slowly, the production per volume is so much greater that it more than compensates for the time of grinding. The power consumption of the zinc-treated wood increased only five per cent over that of the untreated wood, while the boiled wood increased about 36 per cent, and the steamed wood about 44 per cent.

STRENGTH OF GROUNDWOOD PULPS

In testing the strength of the groundwood pulps, the following tests were made: Elmendorf tear, bursting strength, tensile strength, and stretch. The resulting data are tabulated in Table 5 and presented in chart form in Figure 16.

The pulp from the first grinder series was so weak, consisting mostly of fines and flour, that no strength tests could be made.

The untreated spruce groundwood pulp was the strongest in all respects, including tear, burst and breaking strength.

(Please turn page for Tables 1, 2, 3, 4 and 5; article continued on page 1048.)

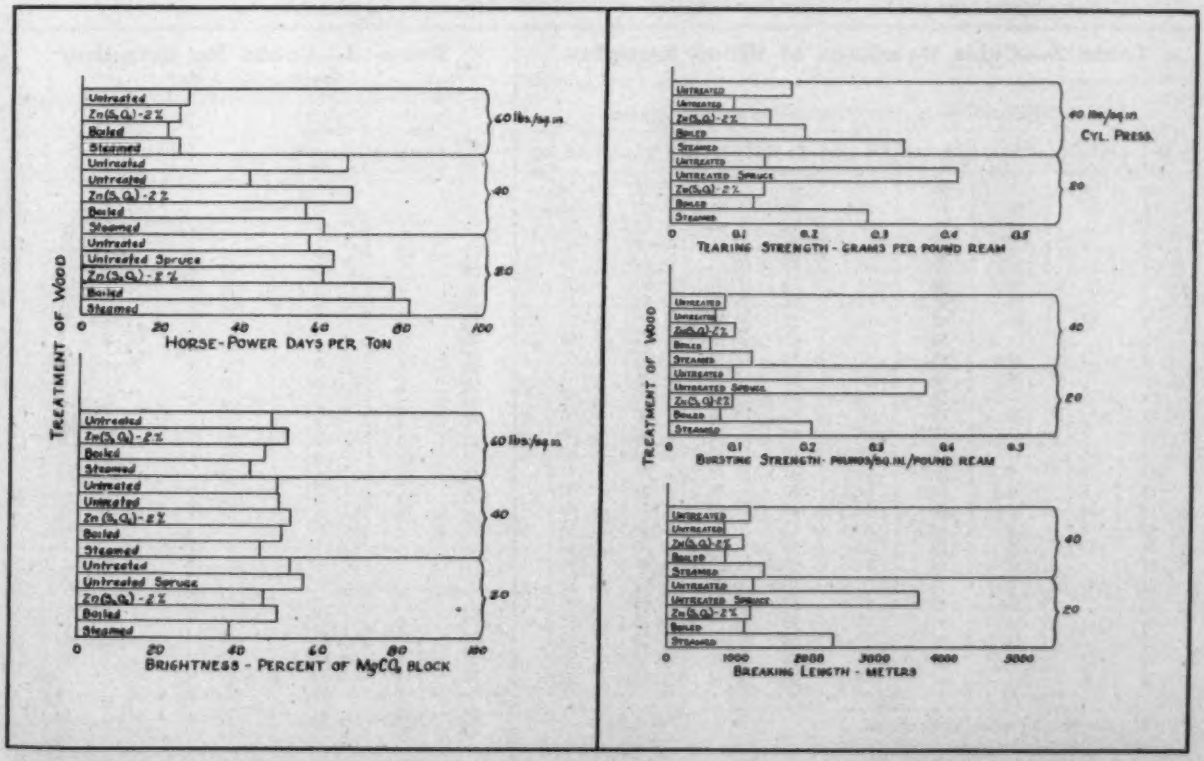


Fig. 15—(left) Effect of the treatment of wood and the grinding pressure on the power consumption of grinding and the brightness of the groundwood pulps. . . . . Fig. 16—(right) Effect of the treatment of the wood on the properties of the groundwood pulps.

Table 1—Analysis of Liquor Extracts

Cook No.	Digester	Chemical[D]	Time of Cooking Hours	Pressure Lb./ Sq. In.	Temp. Deg. C.	Total Solids[C] Per Cent	Ash[C] Per Cent	Soluble Solids[C] Per Cent	Non-Tannins[C] Per Cent	Tannins[C] Per Cent	Wood Lost in Cooking[C] Per Cent	Cook No.
					BOILING							
1	L.L.[A]	—	5	0	100	.50	.08	.42	.32	.10	6.75	1
6	L.L.	—	10	0	100	.40	.07	.34	.25	.10	7.43	6
13	L.L.	—	15	0	100	.25	.06	.25	.18	.07	2.86	13
11	S.S.[B]	—	20	0	96	.18	.07	.16	.12	.04	2.30	11
21	S.S.	—	5	0	97	.14	.04	.15	.13	.02	9.10	21
4	L.L.	Ca—4	5	10	110	2.45	.81	.03	.....	.....	.....	4
7	L.L.	Z—2	5	0	100	2.33	1.49	2.70	.....	.....	5.20	7
20	S.S.	Z—1	5	0	97	1.25	.64	1.25	.....	.....	1.24	20
18	L.L.	NaM[E]—4	5	0	100	3.66	2.04	3.57	.....	.....	3.03	18
25	L.L.	Z—2	5	0	99	1.95	1.14	2.17	.....	.....	5.50	25
26	L.L.	Z—3	5	0	100	2.36	1.11	2.37	.....	.....	4.50	26
31	L.L.	Z—2	5	0	100	.62	.19	.53	.....	.....	15.00	31
32	L.L.	Z—2	5	0	100	1.31	.63	1.34	.....	.....	17.10	32
					STEAMING							
2	L.L.	—	5	25	128	.07	.05	.07	.03	.05	14.20	2
5	L.L.	—	10	25	128	.16	.06	.16	.10	.06	13.30	5
10	L.L.	—	15	25	110	.34	.10	.28	.18	.10	13.50	10
12	L.L.	—	20	25	110	.63	.29	.60	.44	.16	11.60	12
14	L.L.	—	5	50	138	.39	.20	.37	.26	.11	13.30	14
15	L.L.	—	10	50	135	.50	.33	.44	.35	.09	7.30	15
19	L.L.	—	15	50	138	2.73	.43	1.90	1.18	.72	7.90	19
22	L.L.	—	20	50	131	6.25	1.18	3.62	2.34	1.28	3.70	22
3	L.L.	SO_2—5	5	25	109	.32	.07	.30	.31	.00	18.80	3
8	L.L.	NH_3-½SO_2-1	5	25	112	1.98	.08	1.76	.....	.....	11.80	8
9	L.L.	NH_3-1SO_2-2	5	25	112	1.29	.10	1.95	.....	.....	12.30	9

A—Lead-lined upright stationary digester, steam-heated (directly and indirectly).

B—Stainless steel upright stationary digester (oil-heat exchanger).

C—All values expressed as per cent based on oven-dry weight of wood.

D—Z—zinc hydrosulphite (ZnS_2O_4).
Ca—calcium bisulphite ($Ca(HSO_3)_2$).
NaM—sodium meta-silicate.
The number following designates the per cent of chemical added on basis of o.d. weight of wood.

E—Metso brand—Philadelphia Quartz Co.

Table 2—Color Readings of Wood Samples

Cook No.	Filter Number with Wave Length in Millimicrons							
	#76-430	#50-460	#75-490	#74-530	#73-570	#72-610	#71A-650	#70-700
0	39.5	47	50	57	60	64	68	74
1	30	34	37	44.5	53	61.5	65	71
2	33	34	37	46	53	60	65	71
3	9	7	8	12	15	22	28	32
4	30	34	37	38	45	55	61	69
5	.....	18.5	19.5	24.5	33	37.5	50	52
6	33	33.5	36.5	44	51	58	65	68
7	38	38	42.5	49.5	57	61	66	73
8	.....	29	30	36	47	50	64	64
9	.....	32.5	32	42	44	52	67	66
10	22	20	22	28	36	42	48	53.5
11	29	31	31.5	40	46	52	59	63
12	.....	20	20	26	32	38	46	53
13	.....	32	33	39	47	56	62	66
14	13.5	13	14	21.5	28	33.5	40.5	47.5
15	9.5	9.5	10.5	16.5	22.5	27	35	41.5
16	8.5	8.5	10.5	14.5	20	24.5	33.5	38
18	24	26	29.5	36	42	47	57.5	64
19	8.5	8	10.5	12.5	17	21	26.5	34
20	25	27	28	32	39	46	50	54
21	.....	41	43	51	57.5	62.5	67.5	72
22	.....	6	7.5	8.5	10.5	16	19	22
25	.....	38	43.5	51.5	53	58	63	65
26	.....	51	55	63	70	74	78.5	81.5
27	.....	43	46	53	58	64	70	74
31	.....	48	52	58	64	70	73.5	80
32	.....	41	42	45	55	64	68	71

Higgins Photo-Electric Colorimeter.
Wratten Standard Filters.
Standard—Magnesium Carbonate Block.
Wood Samples—Tangential and Radial Sections.

Table 3—Cooks for Grinding

Digester—Lead-lined

Cook No.	Time of Cooking Hours	Gauge Pressure Lb./Sq. In.	Temp. Deg. C.	Chemical	Wood Lost in Cooking Per Cent
			BOILING		
23	5	0	100	.....	13.4
28	5	0	100	.....	10.2
31	5	0	100	Z-2	15.0
32	5	0	100	Z-2	17.1
33	5	0	100	Z-2	9.0
35	5	0	100	.....	14.7
36	5	0	100	.....	10.0
37	5	0	100	.....	8.8
40	5	0	100	Z-2	5.9
41	5	0	100	Z-2	6.3
42	10	0	100	.....	7.0
43	10	0	100	.....	12.0
44	10	0	100	Z-2	14.7
46	10	0	100	.....	16.7
48	10	0	100	Z-2	16.1
			STEAMING		
29	5	25	118	.....	12.7
30	5	25	118	.....	13.7
34	5	25	119	.....	15.4
38	5	25	118	.....	9.9
39	5	25	120	.....	5.9
45	10	25	125	.....	14.2
47	10	25	122	.....	10.7

Z—Zinc Hydrosulphite (ZnS_2O_4). The number following designates the per cent of chemical used based on o.d. weight of wood.

Table 4—Grinding of Untreated and Treated Yellow Birch

Grinding, Power, and Production Data (All quantities on oven-dry basis).

Grinder Run No.	Cook Nos.	Surface of Stone		Grinding Pressure		Temp. of Stock in Pit in Deg. Fahr.	Speed of Grinding in f.p.m.	Wood Ground	Consist. of Grinding	Duration of Grinding	Prod. Per 24 Hrs.	Power Requirements			
		Type of Burring[A]	Stone	In Cyl. Lb./ Sq. In.	On Wood[B] Lb./ Sq. In.							Input to Grinder	Per Ton Per 24 Hrs.	Consumed by Wood[D]	Per Ton Per 24 Hrs.
								Lb.	Per Cent	Minutes	Tons	hp.	hp.	hp.	hp.
Series No. 1															
1	31, 32, 33	a	Very	60	60.6	175	2515	68.24	7.80	16.13	3.067	75.4	24.6	63.0	20.55
2	Untreated	a	Sharp	60	60.6	175	2515	49.23	8.76	16.73	2.13	56.4	26.4	43.9	20.62
3	23, 28, 35	a	"	60	60.6	175	2515	67.13	8.70	19.02	2.54	54.3	21.4	41.9	16.50
4	29, 30, 34	a	"	60	60.6	175	2515	68.51	7.32	20.45	2.41	58.1	24.1	45.7	19.09
Series No. 2															
5	Untreated	a, b, c,	Medium	40	40.4	175	3355	45.9	5.01	30.75	1.075	71.2	66.3	56.5	49.4
6	40, 41	a, b, c,	"	40	40.4	175	3355	55.5	4.67	42.83	.932	62.7	67.2	49.4	52.9
7	36, 37	a, b, c,	"	40	40.4	175	3355	56.0	6.00	31.75	1.27	70.0	55.2	56.7	44.6
8	38, 39	a, b, c,	"	40	40.4	175	3355	57.8	4.55	32.75	1.272	76.4	60.0	63.1	49.6
9	Untreated	a, b, c,	"	40	40.4	175	3355	50.4	5.02	18.00	2.015	84.5	41.8	71 2	35.1
Series No. 3															
10	Spruce Unt.[C]	a, b, c,	Medium	20	20.2	175	3355	42.7	4.40	37.2	.826	52.0	62.8	40.2	48.7
11	Untreated	a, b, c,	"	20	20.2	175	3355	42.7	4.16	31.9	.962	54.7	57.0	42.9	44.7
12	44, 48	a, b, c,	"	20	20.2	175	3355	49.5	5.00	44.23	.805	49.3	60.0	37.8	47.0
13	43, 46	a, b, c,	"	20	20.2	175	3355	46.8	4.60	55.0	.612	47.5	77.5	36.0	58.8
14	45, 47	a, b, c	"	20	20.2	175	3355	53.7	4.95	80.0	.484	39.5	81.6	28.0	57.8

A—Burrs used were as follows: a=8 cut spiral burr with 1.25 inch lead; b=No. 16 Diamond point burr; c=carborundum brick.

B—Calculation based on 113 sq. in. cylinder piston area and 112 sq. in. pocket area (8-inch width wood and pocket 14 inches deep).

C—Blocks of Spruce wood, after soaking, were ground. Weight determined from volume and specific density (25 lb./cu. ft.).

D—The power input was corrected for no load power requirements of motor and grinder.

Table 5—Grinding of Untreated and Treated Yellow Birch . . . Physical Properties of Groundwood Pulps

Grinder Run No.	Cook Nos.	Freeness[A] 0.3% Cons. at 20° C. cc.	Bulk in cc./gm.	Mullen[B] Lb./Sq. In. /Lb. Rm.	Tear[B] in Gms/Lb. Ream	Breaking Length in Meters[B]	Stretch[B] Per Cent	Brightness Per Cent	COLOR OF PULP[C] In Per Cent								Basis Weight 25x40—500 o.d. in Lb.
									430[D]	460[D]	490[D]	530[D]	570[D]	610[D]	650[D]	700[D]	
Series No. 1																	
1	31, 32, 33	40	3.72	(E)	.....	.....	.....	51.5	.....	54.0	56.6	61.5	65.5	69.5	73.5	77.5	102
2	Untreated	75	3.04	"	.....	.....	.....	47.8	.....	49.0	52.0	58.0	66.0	71.0	75.0	78.0	85.5
3	23, 28, 35	160	3.58	"	.....	.....	.....	46.0	.....	48.5	51.0	53.0	62.0	65.0	70.0	73.5	101
4	29, 30, 34	165	3.61	"	.....	.....	.....	42.7	.....	43.5	47.0	51.5	58.0	62.0	70.0	72.2	70
Series No. 2																	
5	Untreated	85	2.66	.079	.17	1177	1.00	49.2	46.5	49.5	53.2	56.8	63.3	68.1	71.5	74.3	49.2
6	40, 41	60	2.68	.095	.14	1072	1.32	52.5	49.5	52.5	55.5	59.0	64.4	69.5	72.3	75.0	46.0
7	36, 37	50	2.63	.062	.19	847	1.70	50.8	48.0	50.0	54.4	57.2	62.8	67.8	71.2	73.5	52.6
8	38, 39	30	2.57	.118	.33	1371	1.01	45.5	43.0	46.4	49.2	52.5	57.3	61.7	66.2	69.0	42.2
9	Untreated	60	2.74	.066	.09	830	1.00	49.5	45.5	49.0	53.3	56.4	64.0	68.2	72.0	74.8	50.6
Series No. 3																	
10	Spruce Unt.	25	2.19	.368	.41	3590	1.53	56.0	50.5	58.0	63.5	67.5	72.0	75.0	78.5	79.5	51.8
11	Untreated	50	2.60	.092	.13	1240	0.90	53.0	47.0	53.0	56.5	60.0	67.5	71.0	75.0	76.5	48.6
12	44, 48	40	2.72	.091	.13	1175	0.80	46.6	44.0	47.5	50.5	53.0	58.5	60.5	64.5	67.0	46.4
13	43, 46	60	2.65	.075	.12	1132	0.67	49.5	46.5	51.5	52.5	56.5	62.0	65.0	68.5	69.0	47.7
14	45, 47	40	2.46	.205	.28	2355	1.50	37.5	36.0	41.0	41.0	44.0	50.5	54.0	57.0	61.5	51.3
Commer. Samples[F]				.22	.68	1780											

A—Freeness was taken on the Canadian Standard Freeness Tester.

B—All strength tests were made at 65 per cent relative humidity and 72 deg. Fahr.

C—Standard—Magnesium Carbonate block.

D—Millimicrons.

E—Too weak to test.

F—Average of 29 different North American Newsprint groundwood pulps. (From Forest Products Laboratory unpublished data.)

The pulp from the 40-pound cylinder pressure series gave higher tear factors than the pulp from the 20-pound series. The steamed wood was the strongest in all respects for yellow birch, especially in the bursting and tensile strengths. In the tear test, the steamed wood, ground at 40 pounds pressure, gave a pulp with a higher tearing strength than that ground at 20 pounds pressure.

Boiling the wood for 10 hours did not seem to have as great an effect on the strength qualities as was expected, even with the lower grinding pressure. The pulp resulting from grinding steamed wood, cooked under 25 pounds pressure, for 10 hours and ground at 20 pounds cylinder pressure compares rather favorably with commercial newsprint groundwood (Table 5). The tearing strength is much lower and in some instances the breaking length is greater than in commercial pulp.

Considering the fact that commercial newsprint contains about 20 per cent spruce sulphite pulp, which would bring up the tear factor, the difference in the tear factor of commercial newsprint and that of groundwood pulp from yellow birch can be understood.

COLOR OF GROUNDWOOD PULPS

The best color obtained from these pulps was that from the untreated spruce (Figure 14 and Table 5). The pulp from untreated yellow birch was slightly lower, varying slightly among the different runs. The pulps from the zinc-treated wood and from the boiling cooks of five hours were about the same in color, while in the 10-hour series the pulp from the boiling cooks was better in color than from the zinc-treated wood. The steamed wood was the darkest in color in every case.

BRIGHTNESS

The brightest pulp was that manufactured from the untreated spruce wood (Figure 15) while the next in order was the zinc-treated and untreated birch wood. Pulps from boiled wood came next and the pulp from the steamed wood was the lowest in brightness.

SUMMARY

The amount of constituents i.e., ash, total solids, soluble solids, tannins, and non-tannins in the liquor extracts after boiling decreased as the length of the cooking period increased.

The amount of these constituents in the liquor extracts after steaming increased with the time of steaming, slowly at first, but at an increasing rate as the time of cooking lengthened.

An increase in the pressure of steaming had a very marked tendency to increase the amount of the constituents in the liquor extract. Again the rate of increase is much greater in the longer cooks.

The brightness of the wood samples decreased with the time of cooking and also with the pressure of steaming.

It is possible by the use of reducing agents—such as zinc hydrosulphite—to retard the darkening of the wood and even to improve it upon treatment with only a small percentage of the reducing agent (1 to 3 per cent).

No appreciable effect was obtained by increasing the length of treatment or by decreasing the grinding pressure from 40 to 20 pounds pressure, except in the case of steaming.

Steaming proved to be the most profitable and economical method of treatment for it gave a satisfactory pulp.

Table 6—Relation of Power Consumed in Grinding the Wood to the Strength of the Resulting Pulp

Grinder Run No.	Surface of Stone	Cylinder Pressure* Lb./Sq. In.	Horse-power Days Per Ton hp.	TEAR Gms./Lb. Rm.	TEAR Per Unit hp.†	MULLEN Lb./Sq. In./Lb. Rm.	MULLEN Per Unit hp.†	TENSILE Meters	TENSILE Per Unit hp.
Series No. 1									
1	Sharp	60	24.6	.....	.....	.....	.....	.....	.....
2	"	60	26.4	.....	.....	.....	.....	.....	.....
3	"	60	21.4	.....	.....	.....	.....	.....	.....
4	"	60	24.1	.....	.....	.....	.....	.....	.....
Series No. 2									
5	Medium	40	66.3	.17	.26	.08	.12	1177	17.8
6	"	40	67.2	.14	.21	.10	.14	1072	16.0
7	"	40	53.2	.19	.34	.06	.11	847	15.3
8	"	40	60.0	.33	.55	.12	.20	1371	22.8
9	"	40	41.8	.09	.22	.07	.16	830	19.8
Series No. 3									
10	Medium	20	62.8	.41	.65	.37	.59	3550	57.1
11	"	20	57.0	.13	.24	.09	.16	1240	21.7
12	"	20	60.0	.13	.22	.09	.15	1175	19.6
13	"	20	77.5	.12	.15	.08	.10	1132	14.6
14	"	20	81.6	.28	.34	.21	.25	2355	28.8

(†) Values in these columns have been multiplied by 100 for convenience in tabulating.

(*) Cylinder pressure exceeds unit pressure by 5.7% in this experimental grinder.

The work on this problem and covered by this report is by no means complete, but is sufficient to indicate that further research into the types of stone surfaces, the pressure, temperature, and speed of grinding, and the use of reducing agents in the steaming process should be undertaken. Any analytical data are purely orientative. It would also be advisable to investigate the possibility of bleaching the resulting groundwood pulps with reduction bleaching agents and to develop processes for utilizing the resulting pulps in various types of papers.

◆

VIBRATING PAPER MACHINERY CONNECTIONS

W. F. SCHAPHORST, M.E.

▶▶▶ VIBRATING paper mill machinery often causes trouble in several ways, one of the most serious being broken pipe and other connections. In these instances, the vibration of the machinery is sufficient to cause crystallization in the metal; and, as a result, early fracture occurs at the point of connection.

It has been found that breakages of this kind most commonly occur in connections that are made too high. The best solution is to bring the pipe or part to be connected down to a position near the foundation and make the connection there. The explanation for this procedure is that the amplitude of vibration is always least at the foundation and greatest in the parts of the machine that are most remote from the foundation, precisely as in a tuning fork. Thus, for instance, the top of a beater, motor, or steam turbine moves farther, as it vibrates, than does the base.

The logical place for connecting pipes, cables, ducts, etc., is therefore as near the point of least vibration motion as practicable—near the foundation. This applies also to flexible types of connectors made specially to resist vibration, whether metallic or non-metallic, because even they have their bending limitations.

Neponset Credit Union

EDGAR M. GROUT

Interior Credit Union office.

▸▸▸ THE NEPONSET Credit Union, an organization of the employees of Bird & Son, Inc., at East Walpole, Massachusetts, rounded out 25 years of service on November 1, 1940. It has a membership of more than 2500 and total assets of more than $300,000.

From the very first, the purpose of the Credit Union has been to promote thrift among its members by giving them an opportunity to save money in small amounts, and to provide a means for borrowing small amounts of money at reasonable rates of interest. For nearly 20 years previous to 1915, Bird & Son, Inc., employees had been encouraged by the management to save regularly through the Massachusetts Co-operative Banks. The organization of the Neponset Credit Union served as another incentive toward regular savings and in addition provided a much needed source from which small loans might be made in times of emergency. Until the formation of the Credit Union, many Bird & Son workers had turned to outside loan and credit companies for cash to meet a doctor's bill or some unexpected household expense, and had paid exorbitant rates of interest. The first Board of Directors included a number of solid, highly respected workers from the plant, and such representatives of management as the treasurer, the director of personnel, and a man who shortly afterwards became Purchasing Agent for the Company. Thus, from the start, the Credit Union had the support of men who were best able to guide the organization in the right direction.

Although the Credit Union is endorsed 100 per cent by the Bird & Son management, it is actually an organization of the employees who annually elect their own Board of Directors and decide all the major policies of the organization. It is set up under the Credit Union Banking Laws of the State of Massachusetts and the books are examined at least once a year by examiners from the Bank Commissioner's office.

At the end of the first month of business in 1915, the statement showed a total of $1,137 in shares, $4.50 in deposits, and $450 made in loans. Today the share account has $157,438, deposits stand at $115,111, and the outstanding loans are $90,304. Each member must purchase at least one $5.00 share to join the Credit Union, and may purchase a total of 40 shares, or $200 worth. Double this amount may be bought in a joint account. A large section of the shares now held were purchased for investment purposes, as the share dividend has been 5 per cent for a number of years.

Savings deposits have increased more than $54,000.00 in the past five years. Comparatively few members use the savings account for long term investments, but instead employ it as a convenient method of saving money for large bills which must be met annually —taxes, vacation, insurance, clothing, education, doctor's bills, Christmas expenses, and other items like these. Two per cent compounded quarterly is paid on all savings up to $250. Joint accounts receive the same interest payments on all deposits up to $500. There are more than 2,000 deposit accounts on the books today.

Although there is better government regulation of public loan companies today than in 1915, a large number of members still turn to the Credit

Neponset Credit Union Board of Directors.

Union knowing that money can be borrowed there easily, at low rates of interest, and can be paid back conveniently by payroll deductions. Any member in good standing can always borrow up to $100 in his own name without security at 3 per cent. With acceptable co-makers to sign with him, he can borrow even larger amounts at the same rate, and if he can put up security for the loan, almost any amount can be borrowed at the rate of 2½ per cent per year. This represents a substantial saving over loans obtained from the usual credit companies, many of whom charge the full legal amount of interest permissible under the law —36 per cent.

A recent survey of the purposes for which loans are made at the Neponset Credit Union brought out some interesting figures. The largest single item was for doctor's bills and hospital expenses which totaled 19 per cent of all loans outstanding at the present time. Next in line were real estate loans, either for purchase or for repairs. These amounted to 17 per cent. Then in order came: household bills, 12 per cent; automobiles, 7 per cent; fuel, 6 per cent; taxes, 5 per cent; insurance, 4 per cent; clothing, 4 per cent; and education, 2 per cent. Included in the remaining 24 per cent are a large number of miscellaneous and personal reasons that do not fit any of the other classifications. In the past 25 years, the Neponset Credit Union has loaned a total of $693,676.51 to its members.

Now entering its twenty-sixth year, the Neponset Credit Union is still showing a healthy growth and is constantly welcoming new accounts on its books. William S. Jackson, of the company's Norwood Roofing Plant is the president. John J. White, of the East Walpole Box Factory No. 1 is a vice president. A. W. Smith, is the treasurer and is now serving his twentieth year in that capacity. Howard S. Whitney, auditor for Bird & Son, Inc., is clerk of the Credit Union. In addition to these men, the present Board of Directors includes in its membership two plant superintendents, two assistant superintendents, a compositor from the printing department, the director of personnel, two plant foremen, and the assistant auditor of the company.

Apparently, the Credit Union has not reached as yet its peak of growth and usefulness. It is the expectation of those who run its affairs that it will continue to grow in the years ahead, and carry on its good work of promoting thrift among the workers in Bird & Son, Inc.

Testing Paper *for* Tarnishing Action

C. H. OHLWILER, Chief Chemist
American Optical Company

▸▸▸ SPECIAL ANALYTICAL ATTENTION is given paper containers used to wrap and ship American Optical Company spectacle frames, for the reason that the company will take no chances on the presence of corrosive or tarnishing chemicals in these containers or packages. As a matter of fact, the company goes so far as to analyze all envelopes, printing inks, wrappers, twine, and other materials.

On the surface, it would appear as though such tests were of minor importance. But to those who prescribe and fit glasses, and to those who wear them, the absence of tarnishing agents in everything that comes in contact with spectacle frames is of vital importance. Such precautions are assurance that no matter how long the optical products may be stored, there will be no discoloration from tarnish, no specks of deterioration from corrosion caused by the original containers.

A specific process for analyzing paper and printing inks, developed in the research department of American Optical Company, is rapidly becoming a standard test. Originally, the causes of tarnish on metal goods presented a perplexing problem in analytical chemistry. It was well known that metal goods of a bright appearance tarnished in the stock of the manufacturer or in possession of the dealer. Naturally, a solution to this tarnish problem had to be found. The company's reputation for fine-quality spectacle frames, free of defects, was dependent on evolving an efficient antitarnish test for packaging materials.

The importance of such a test is apparent for the simple reason that the company annually purchases millions of envelopes for packaging purposes and many thousands of pounds of cardboard and printing inks. And, as all of this material must be free of tarnishing agents, it is necessary to analyze samples of each lot purchased.

At the time the first investigations were begun, it was generally believed that tarnishing of metals was caused by atmospheric conditions. Some authorities declared that sulphur was the cause, and methods were applied by certain technicians to detect sulphur in the surrounding media. They failed because some combinations of sulphur, such as sodium sulphate, will not cause tarnishing while other combinations, like sodium sulphide in extremely small quantities, will cause metals to tarnish.

Apparatus used for these studies, with some modification, was the same as that used for regular routine testing today. The original equipment consisted of a 250 cc. Erlenmeyer flask fitted with a cork through which was inserted a small filter tube. A piece of cloth sensitized with lead acetate was placed over the top of the filter tube and was held in place by a rubber band while the tests were made.

In making tests, the material to be tested for tarnishing sulphides was placed in the flask. A small quantity of water was added and heated until it boiled. Then a small amount of dilute sulphuric acid was quickly added and the boiling continued for approximately a minute. Any tarnishing sulphide present and capable of giving off hydrogen sulphide reacted in blackening the sensitized cloth.

Whenever an example of tarnish was found, the surrounding material was tested as described and invariably this material was found to yield hydrogen sulphide. These tests, of which many were made, showed sulphide reactions with wrapping papers, white and kraft envelopes, white tissue paper, and printer's ink of various colors.

As to the possible sources of the sulphides, a few of the offending ingredients are here suggested. The paper manufacturer may use a small quantity of sulphide of zinc or ultramarine blue to neutralize a yellowish tint and thereby produce a white paper. The manufacturer of printer's ink may fall into the same error by using similar compounds, lithopone, or other sulphide-bearing materials as constituents of his inks.

Having found the relation between tarnished metal goods and the prox-

imity of sulphide-bearing materials, the next step was to produce the tarnish with paper which gave the sulphide reaction as described. Accordingly, some spectacleware was placed in envelopes, some of which gave positive tests and others negative tests for sulphides. Then the envelopes were laid away in the same room for occasional observation.

In less than two weeks tarnish had developed on the metal in the sulphide-bearing envelopes, while the metal in the other envelopes remained bright and untarnished. As time went on, the tarnish intensified on the one group of metals while the other remained untarnished.

These tests were conclusive and fully justified setting up the present standard method of antitarnish control. The test, as explained below, detects in a few minutes any tarnishing action which, in actual practice, may take weeks or months to develop.

Specifications for Antitarnish Materials

All paper and cardboard materials, also printer's inks, for use by American Optical Company in packaging must be antitarnish. They must be free from sulphides or any other ingredient that will have a tarnishing effect on metal goods.

When a shipment of paper, cardboard, envelopes, boxes, or printer's ink is received, a fair or representative sample will be taken and tested in accordance with method as hereinafter described.

If the material gives a positive test, the shipment will be rejected and returned to the shippers at their expense.

For the purpose of avoiding rejections, the laboratory will test samples of manufacturer's or dealer's stocks, or give any help they may desire in making their own tests.

Method for Testing Antitarnish Materials

Apparatus: A cylindrical funnel (see sketch) with stopcock *(B)* sealed into side of 250 cc. Erlenmeyer flask *(A)*. Filter tube *(C)* in cork stopper to fit flask. Sensitized cloth *(D)* attached to top of filter tube *(C)* with a rubber band. The cloth *(D)* is a piece of batiste sensitized by dipping into a 3 per cent slightly acid solution of lead acetate, then dried, cut into suitable squares and kept in a bottle for use.

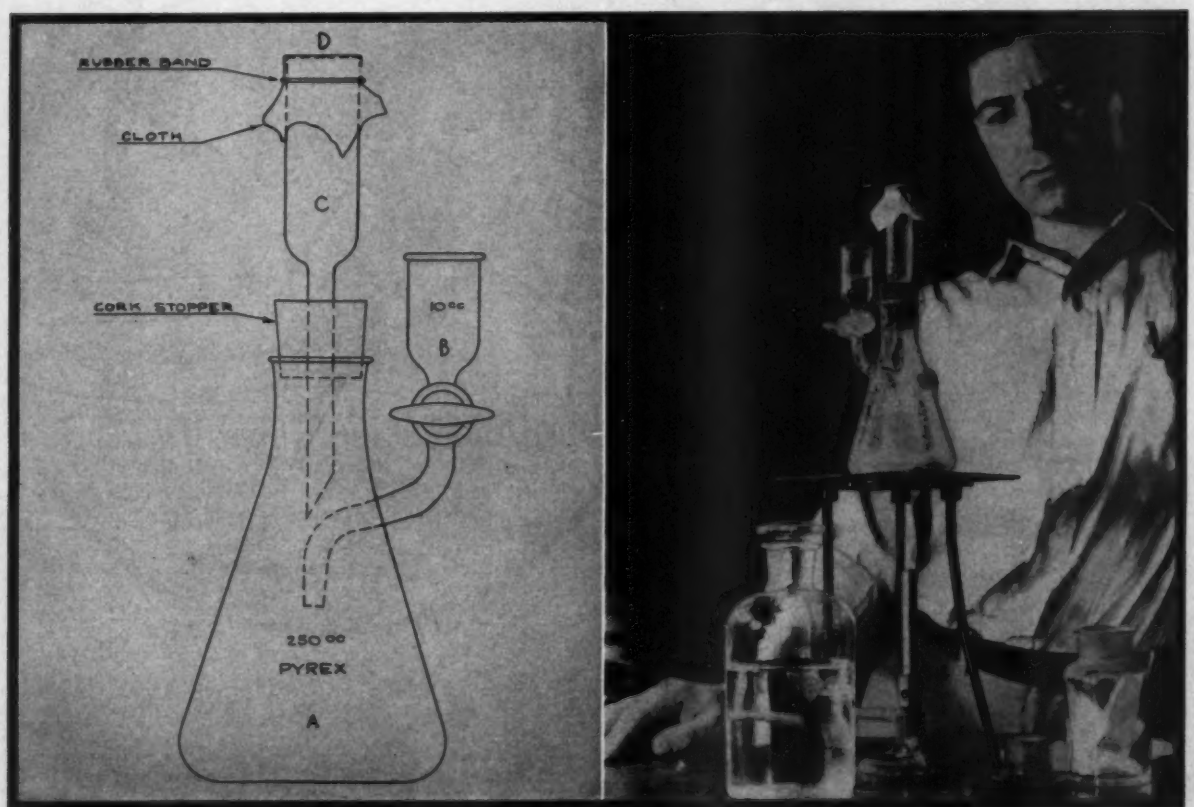
Method: To make test, put 2.0 grams of paper sample (or 0.2 gram of printer's ink) into flask *(A)* with about 50 cc. of water. Assemble apparatus as shown in sketch, add about 5 cc. of dilute sulphuric acid (1 volume H_2SO_4 with 3 volumes H_2O) to funnel *(B)*, set over burner and soon after boiling begins, or when the air has been expelled, run in the dilute sulphuric acid and continue to boil for about a minute. Any sulphide in the sample will be driven out as hydrogen sulphide and will blacken the sensitized cloth.

Notes: The apparatus used was of Pyrex glass, made by the Corning Glass Works, Corning, New York, according to our sketch.

The filter tube *(C)* is 20 mm. top diameter, with stem of large bore and long bevel, so that liquid is not carried up with the vapors to contaminate the sensitized cloth.

A good way to treat printer's ink is to weigh the sample on paper which gives a negative test; spread it out thinly and allow it to dry a little before testing.

The apparatus has been standardized, and it has been found that a sulphide content of 1.0 part per million of sulphur shows a decided reaction with the sensitized cloth when a 2.0-gram sample of paper is used.



Left—Sketch of apparatus used for antitarnish test. Right—American Optical Company chemist testing paper for compliance with antitarnish standards.

PAPER SKETCHES

So SCARCE WAS PAPYRUS IN THE REIGN OF TIBERIUS, THAT THE SENATE WAS OBLIGED TO APPOINT COMMISSIONERS TO DOLE OUT THE PRECIOUS SHEETS TO QUALIFIED APPLICANTS.
IMPORTATION OF NEWSPRINT IN THE UNITED STATES IN 1914 TOTALED ABOUT 278,000 TONS, OR 14.6 PER CENT OF THE DOMESTIC CONSUMPTION. IN 1938, NEWSPRINT IMPORTS TOTALED 2,274,603 TONS, OR 73.3 PER CENT OF THE DOMESTIC CONSUMPTION.
DURING THE 1770's
WHILE SERVING IN HOLLAND AS AN OFFICER IN THE BRITISH KENT MILITIA, JAMES WHATMAN LEARNED HOW TO MAKE THE PAPER FOR WHICH HE BECAME FAMOUS.
IN THE 1850's 9 MEN
HELPED BY PULLEYS WERE REQUIRED TO RAISE THE PULP-LADEN MOULD OUT OF THE VAT WHEN MAKING SHEETS OF HANDMADE PAPER, SIZE 53" X 31".

B. F. PERKINS & SON, Inc.

ENGINEERS AND MANUFACTURERS

HOLYOKE, MASS.

THE LARGEST MANUFACTURERS OF ROLLS IN THE WORLD

A L L I E D

OLD CARRIER PLANT NOW A DEFENSE UNIT

Sale of the old Carrier Corporation plant in Allentown, Pennsylvania, to the American Armament Corporation was announced recently. The latter firm is engaged in manufacturing artillery, machine gun, aerial bomb and anti-aircraft gun parts. The 52,000-square foot building was one of five plants vacated in 1937 when the Carrier Corporation moved to Syracuse, New York.

According to J. I. Lyle, president of the air conditioning firm, the American Armament Corporation has instituted a $500,000 program designed to establish the Allentown plant as its principal unit in turning out greatly expanded national defense orders. Between 300 and 600 workers will be employed.

◆

LOWER PRICES ON HERCULES ROSIN ESTERS

Price reductions on five rosin esters have just been announced by the Hercules Powder Company. New base prices, f.o.b. Hercules, Delaware, are as follows:

Abalyn, methyl abietate, reduced from 10 cents to 7 cents a pound; hercolyn, hydrogenated methyl abietate, from 15 cents to 11 cents a pound; flexalyn, diethylene glyco di-abietate (80 per cent solution in xylene) from 14¾ cents a pound to 12 cents a pound; pentalyn, a pentaerythritol-abietate rosin, from 12 cents to 10½ cents a pound, and Pentalyn G, a higher melting pentaerythritol abietate, from 13½ to 12 cents a pound.

◆

▸▸▸ A NEW ADDITION of 56,200 feet is being erected by SKF Industries, Inc., Philadelphia. The new building, an addition to Plant No. 2, is fireproof and of saw tooth construction. A two-story brick wing enclosing 12,000 square feet is extending office facilities at Plant No. 1.

◆

WESTINGHOUSE TRAINS MEN FOR DEFENSE JOBS

Training classes for machine operators are on a 22 hour a day basis at the Dickinson High School, Jersey City, New Jersey, with expert craftsmen from the Westinghouse Electric Elevator Company assisting in the training. Over 450 unemployed men are now being trained for vital defense jobs, it was stated.

The instruction given trains men for specific jobs. Thus, in an eight to ten weeks' course, students are qualified to fit into jobs which would normally require months of study. Seventy-five per cent of the course teaches men how to run their machines, the remainder being devoted to instruction in blue print reading, measuring instruments, shop mathematics, machine technology and shop safety. Special machine tools needed for the classes have been supplied by Westinghouse.

More than 350 men have found jobs upon completion of the course and hundreds more will be put to work as they complete the course. A similar program of training and hiring is in operation at Westinghouse's plants in East Pittsburgh and elsewhere.

A group of future machine tool operators get their first lesson in the handling of a turret lathe from John Ertler, of Westinghouse Electric Elevator Company, furloughed for emergency training work in Jersey City Dickinson High School.

◆

LIGHTING UP FOR NATIONAL DEFENSE

Improved flood lighting of industrial plants will help foil would-be saboteurs, Oscar P. Cleaver, illuminating engineer for the Westinghouse Lamp Division, stated recently before 300 plant engineers and executives assembled in Buffalo, New York.

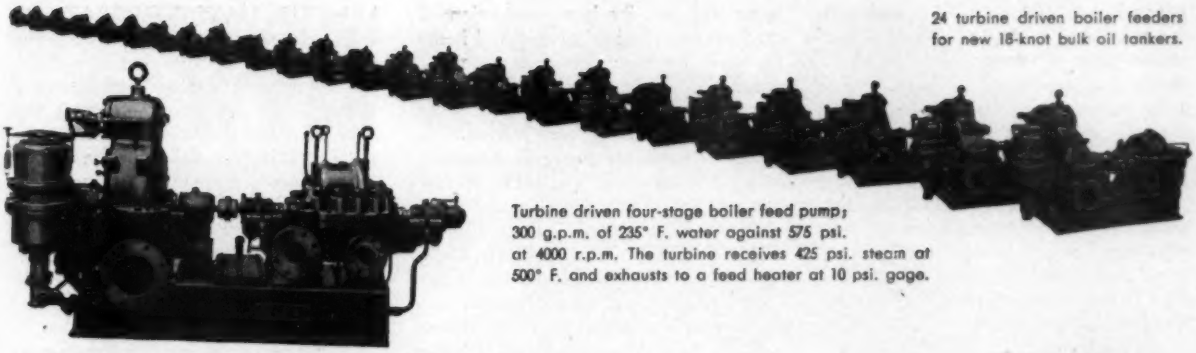
Mr. Cleaver pointed out that it is essential that sufficient shadowless light illuminate considerable area surrounding plants, keeping watchmen in the dark, yet covering every inch of possible entrance. As a protection against blackouts, Mr. Cleaver revealed, "black light" has been perfected to assure safety to workers under adverse conditions. Fluorescent paints and dyes which glow when irradiated by "black light" may be used to coat passageways and parts of machinery to guide workers in a "lightless" plant. Mr. Cleaver, who has become well known as a lecturer and writer on lighting subjects, was responsible for many of the lighting effects at the Chicago and New York World's Fairs.

◆

AMER. CYANAMID ADDS NEW SIZES

Substantial advances have been made by American Cyanamid Company in sizes for paper during 1940. Among the new products of this class are:

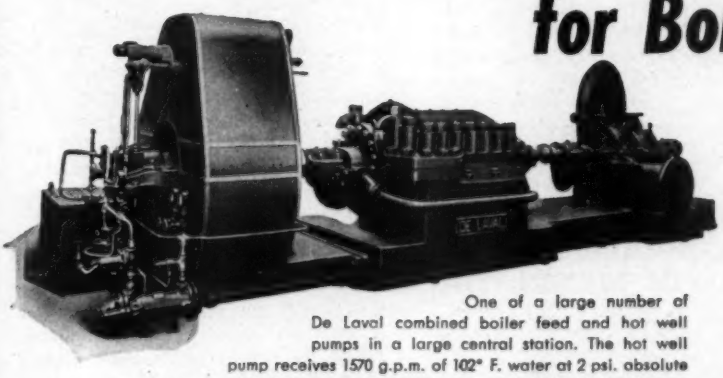
A high free rosin size, Aerosize 400, which possesses stability to hard water, is easily handled, and produces improved resistance to lactic acid; a new wax emulsion stable to acid and alum, sold as Alwax 251, is stable to handling, free from foaming and can be used in the beater or size tub, or for surface sizing on the calender rolls; acid stable rosin-wax sizes used in combination with rosin size eliminate operating difficulties previously encountered with other types of wax size, and give higher sizing efficiency, and



24 turbine driven boiler feeders for new 18-knot bulk oil tankers.

Turbine driven four-stage boiler feed pump; 300 g.p.m. of 235° F. water against 575 psi. at 4000 r.p.m. The turbine receives 425 psi. steam at 500° F. and exhausts to a feed heater at 10 psi. gage.

ADJUSTABLE SPEED *for Boiler Feed Pumps*



One of a large number of De Laval combined boiler feed and hot well pumps in a large central station. The hot well pump receives 1570 g.p.m. of 102° F. water at 2 psi. absolute and discharges against 210 psi. gage. The boiler feed pump receives 1455 g.p.m. of 260° F. water under 169 psi. gage and discharges against 1186 psi. gage. The turbine, running at 1770 r.p.m., receives steam at 815 psi. gage and 900° F. and exhausts against 5 psi. gage.

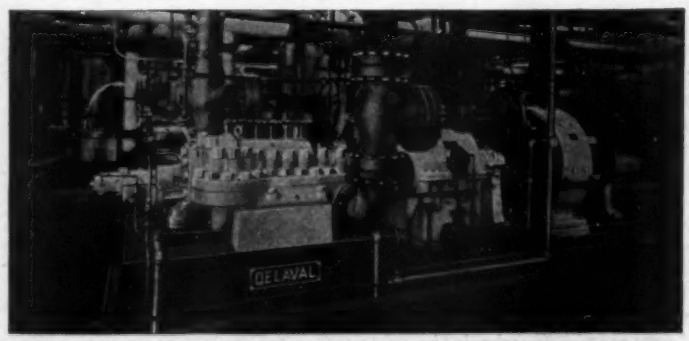
In feeding a boiler, the point where constant excess pressure is required is at the regulator valve. At maximum load, the drop through piping, feed heaters and economizer may amount to 50 lb. or more, and if pump speed is held constant power will be wasted at lesser loads. Adjustable speed is readily obtained by using a

DE LAVAL TURBINE DRIVE

In large units and where the turbine exhaust is used in feed heaters, turbine drive competes in dollar economy with electric drive, besides offering greater security against shutdown.

With motor drive, variable speed can be had with a D.C. or wound-rotor A.C. motor or by using a hydraulic coupling. Slow speed motors are the most adaptable to speed control, but a De Laval speed increasing gear will permit of selecting the pump speed that is best for efficiency and good construction.

Ask for Catalog P-3616



Boiler feed pump driven by variable speed D.C. motor through speed increasing gear. Maximum speed of motor 1185 r.p.m.; pump 2475 r.p.m.; to deliver 1185 g.p.m. of 350°F. water from a suction pressure of 500 psi. to a superposed boiler at 1085 psi. The shaft packings of the pump are protected from high pressure by labyrinth pressure breakdowns and leak-off chambers at each end of the pump.

DE LAVAL *Steam Turbine Co.*
TRENTON, N. J.

MANUFACTURERS OF TURBINES · STEAM HYDRAULIC PUMPS · CENTRIFUGAL PROPELLER ROTARY DISPLACEMENT · MOTOR MOUNTED · MIXED-FLOW · CLOGLESS · SELF-PRIMING CENTRIFUGAL BLOWERS and COMPRESSORS · GEARS · WORM · HELICAL and FLEXIBLE COUPLINGS

Paper Resins 600, 620, 621, and 640 are emulsions of Melamac and Beetle resins used in water leaf or sized sheets for producing special finishes and are also to impart high wet strength, resistance to rubbing when wet, and lower dimensional sensitivity to humidity.

At Wallingford, Connecticut, the company has a new plant under construction scheduled to go into production the early part of 1941. This plant will manufacture synthetic resins and molding compositions.

◆

G-E LABORATORY FORTY YEARS OLD

Forty years ago two men paid a visit to E. Wilbur Rice, Jr., at that time vice president of the General Electric Company in charge of engineering and manufacturing. These two men, one an engineer and the other an attorney, suggested that the G-E company should have a laboratory.

Mr. Rice listened as the two men, Albert G. Davis, head of the patent department, and Dr. Charles P. Steinmetz, explained their idea of a laboratory where scientific investigations might go forward on the incandescent lamp and other problems. From these two men's ideas grew the present modern laboratory which, in recent years, was given the name of "House of Magic."

The laboratory was founded forty years ago—its first experiments taking place in Dr. Steinmetz's barn—and on December 17 of last year the anniversary of its founding was celebrated with a program which began in the afternoon and which culminated in the evening with a dinner at the Mohawk Golf Club. Those taking part in the ceremonies were Dr. Karl T. Compton, president of the Massachusetts Institute of Technology; Charles E. Wilson, president of the General Electric Company; and Samuel Ferguson, president of the Hartford Electric Light Company, who was the first engineer of the G-E laboratory. The laboratory is, at present, under the directorship of Dr. William D. Coolidge.

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LINCOLN'S AWARD PROGRAM SPUR TO NATIONAL DEFENSE

In answer to William S. Knudsen's request for suggestions to speed the National Defense program, The James F. Lincoln Arc Welding Foundation, Cleveland, points to its current $200,000 program of 458 awards as a direct stimulus to this vital objective. According to the Foundation, men who learn and describe how production of machine tools and other essential items in our Defense Program can be speeded up and otherwise improved by use of arc welding, can share in the $200,000 of award money offered.

Such a study can bring its author an award of $13,700, according to the Foundation. There are also additional machine tool awards amounting to $3,200. These include $700, $500, $250, and $150 in both the metal cutting and metal forming divisions.

A second feature of the program pointed out by the Foundation as being of particular interest as an aid in solving the defense problem, is the fact that significant design and manufacturing data contributing to improved production practices, which authors intend to describe in their reports may be applied immediately. A designer of machine tools or other equipment who learns how welded construction can speed up production of his product, can put his ideas into practice at once for the benefit of his company and industry in general.

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ALLIANCE HAS SPECIALIZED IN MARKETING

Five years ago the Alliance Oil Corporation started in business to handle the many and varied by-products of petroleum. Starting with the products of a few Pennsylvania refiners, the company has expanded its scope and now deals with refiners in all parts of the country.

What distinguishes Alliance from other oil concerns is the fact that its members are oil marketers and specialists rather than brokers or jobbers. Some people call this specialized marketing. Others call it common sense. But this company started in to eliminate some of the headaches of the petroleum industry. Its claim is that all it is doing is selling "the right oil to the right customer." Primarily, this means that Alliance acts as principals in every sale of oil it makes, and assumes all risks for quality and finance. Leonard C. Quackenbush, president of Alliance, states this gives the company many advantages over others. In the words of Mr. Quackenbush, "Our business is based on selling the right oil to the right customer. If a refiner turns out a certain grade of oil we find a market for it. If we can't, we suggest manufacturing changes so that it is marketable. Similarly, if a manufacturer needs a certain oil to do a certain job, Alliance will produce that oil, practically tailor-made to whatever the requirements are."

▶▶▶ THE HAYS CORPORATION, Michigan City, Indiana, which some time ago began publication of a series of engineering monographs intended primarily for consulting engineers, has now extended distribution to the technical publication field. These monographs are informative and valuable and contain considerable data relative to boiler room instrumentation and automatic combustion control.

◆

DOWNINGTOWN'S NEW ACQUISITION

The December issue of this magazine recorded the announcement that Downingtown Manufacturing Company, Downingtown, Pennsylvania, had purchased the business, patents, patterns and designs of the Wiener refiner and the Wiener stock regulating valve.

The announcement was not received in time to include other pertinent information regarding this transaction. However, the Wiener refiners are well known and many of them are in service throughout the industry. In taking over the Wiener Refiner Engineering Company business, Downingtown's engineers, who are thoroughly familiar with the Wiener line, are ready to apply John Wiener's experience to any mill's stuff preparation problems. It is also announced that the company will carry a stock of the most widely used sizes and types of Wiener valves, so that immediate shipment can be made.

Reviewing the development of the Wiener products, readers will recall that the original Wiener high speed refiner operating under hydraulic pressure was developed by John Wiener as early as 1925. This refiner was used to handle coarse, steam-exploded fiber used in the manufacture of insulation board. In 1928, a Wiener refiner, with its new principle of pulp preparation, was installed in a paper mill for the first time to operate on sulphite, rope and jute stocks. Following the success of this equipment, a screen-type refiner, combining screening and refining action in a single unit, was developed in 1932 to be followed, still later, by a Wiener refiner of slightly larger size to accommodate mills using 1200 and 1500 r.p.m. motors.

Since 1934, many new developments have taken place, including a small-size refiner with an 8-in. plug, use of the refiner as a pre-beater, and, in 1938, a large refiner with a 24-in. plug was successfully introduced to the paper industry in the handling of raw hot kraft pulp in the black liquor, before being fed to filters, in a black liquor recovery system.

Mr. Wiener has had long experience

There's more to POWELL QUALITY than meets the BUYER'S EYE!

ONLY THE FLAWLESS VALVES GET BY THESE SKILLED CRAFTSMEN . . .

The illustration here shows a section of the testing room for the smaller Powell Valves . . . these men have but a single job, a single thought—to see that no Powell Valve is going to have the slightest chance of a leak through packing chamber, bonnet, or seat when you put it in service . . . so scientifically analyzed by our own Metallurgists that the material in every Powell Valve is free from all imperfections — so carefully machined that every thread, every joint, every face has the precision to admit the interchange of any and every valve part with that of any other Powell Valve of same size and type . . . yet all the design, engineering, and precision machining put into a Powell Valve would go for naught if that valve would not stay leak-proof in service . . . these men in the testing room know that—and that's why only flawless valves leave this department of the Powell plant, ready for a long life of useful service on the lines in your plant.

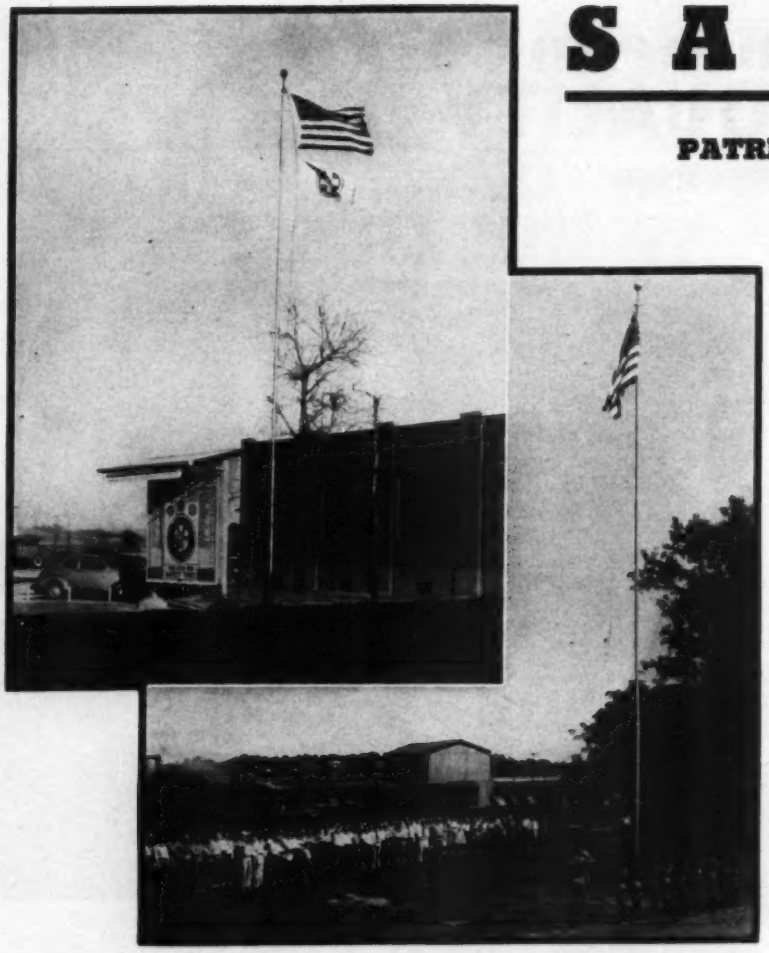
The cut of the valve shown above illustrates a Powell Bronze Gate Valve. . . . There's a Powell Valve in all sizes, for all pressures and temperatures — including a complete line for all services of processing . . . consult the Powell distributor in your vicinity on prices and deliveries, or write us for catalogs and more details.

THE WM. POWELL COMPANY
CINCINNATI, OHIO

You Need More Than a Photograph of the Finished Product to See ALL the Qualities that Make Powell Valves Uniquely Able to Better Serve the Mill Owner.

POWELL VALVES

SAFETY



Two flags fly over the Alton Box Board Company plant until there is a lost-time accident. Then the safety flag comes down.

PATRIOTISM AND SAFETY FLY TOGETHER

An effective mixture of patriotism and safety is to be found at the Alton Box Board Company, Alton, Illinois.

The company recently erected a new flag pole in conjunction with the mill safety program. The flag pole, dedicated with ceremony, flies not only the Stars and Stripes but also the flag of the National Safety Council. When lost time accidents occur, the safety flag is lowered. Beneath the flag pole is a signboard showing department standings. The sign is illuminated and the safety idea is dramatized by a big lottery wheel placed in the center of the signboard above which are the big letters "A Game of Skill." Below the wheel are the words "You Can Win . . . Safety First." Space is allowed for a daily safety suggestion and for the record of the plant.

Dedication of the flag pole was witnessed by the entire office and plant force of the Alton company. Boy Scouts from the nearby Unitarian Church assisted in the dedication ceremonies.

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STRATHMORE'S HOUSE ORGAN FEATURES SAFETY

An interesting report on the recent National Safety Congress was carried in the Strathmore Paper Company's house organ, *Strathmorean,* recently. The account of the Congress, written in the first person, is an enthusiastic version of the meetings and the feelings of Representative C. E. Higgins, of Strathmore, who received not only the National Safety Council trophy for Class C but, in addition, the Edward Benton Fritz Memorial Trophy, presented each year by THE PAPER INDUSTRY AND PAPER WORLD to the winning mill in the Paper Industry Safety Contest. Mr. Higgins was presented with the trophies on behalf of the Strathmore Paper Company's Woronoco Mill Division.

The *Strathmorean* not only carries a story of the safety meeting. In the section of the publication entitled "Intimate Flickers" there is a group picture showing all winners of the safety contest with their trophies and merit awards. The editor and staff of the *Strathmorean* are to be complimented not only for their safety features but also for the other 44 pages of interesting news about their company.

with some large paper mill organizations including: Oswego Board Corporation; Masonite Corporation; Marathon Paper Mills Company; Abitibi Power & Paper Company, Ltd.; and the Minnesota & Ontario Paper Company. He is now manager of the Insulating Board Mill of Johns-Manville Corporation at Jarratt, Virginia.

◆

▶▶▶ USERS OF S. A. E. 4640 STEEL will be interested in knowing that this gear steel is now carried in stock for immediate shipment, by Joseph T. Ryerson & Son, Inc., Chicago.

◆

▶▶▶ AMERICAN FOUNDRY EQUIPMENT COMPANY, Mishawaka, Indiana, is expanding its office and factory facilities. The building program includes a 70x256 ft. addition to the steel fabricating plant, a new steel storage building and an enlarged office building.

▶▶▶ A NEW PLANT containing 150,000 square feet of floor space is now under construction by Aluminum Industries, Inc., Cincinnati, Ohio. This unit, first of several to be built on a large tract of land recently purchased by the company, will be utilized by the company as a foundry for the production of sand and permanent mold aluminum and magnesium alloy castings to meet the varied and growing requirements of industry. The new unit is scheduled to be ready for operation by April 1, 1941.

◆

▶▶▶ LIQUIDATION OF THE Wood Preserving Corporation, a ten-year old company engaged in the prefabrication and pressure treatment of timber, was voted by stockholders. The Wood Preserving Corporation, a subsidiary of the Koppers Company, will now be conducted as an operating and sales division of the latter organization. There are no changes in general management contemplated.

Greater Economy Plus Maximum Efficiency with **WOODBERRY 887** Reinforced Dryer Felts

■ Asbestos yarns woven at intervals into the face of WOODBERRY 887 dryer felts greatly prolong their life and reduce dryer felt costs per ton of paper produced. This feature of greater economy is far from being WOODBERRY 887's whole story. WOODBERRY 887 dryer felts improve the quality of papers which they help to produce. With WOODBERRY 887's, steam consumption is low and other operating costs are reduced. Shrinkage and stretch in these precision built felts have been reduced to a minimum. They require fewer adjustments and account for fewer interruptions in production schedules. Specify WOODBERRY 887 Reinforced dryer felts, not only for greater economy, but for maximum dryer felt efficiency as well.

MT. VERNON WOODBERRY MILLS, INC.

TURNER HALSEY COMPANY

Selling Agents

40 WORTH STREET ★ NEW YORK, N. Y.

CHICAGO · NEW ORLEANS · SAN FRANCISCO · BOSTON · BALTIMORE · LOS ANGELES

ASSOCIATIONS

CHEMICAL EXPOSITION VOTED A HUGE SUCCESS

Covering numerous subjects in the field of applied chemistry, the National Chemical Exposition, which took place December 11-15, at the Hotel Stevens, Chicago, was hailed by those attending as one of the most comprehensive and informative shows ever held.

Feature of the conference was the subject of applied chemistry as contrasted to pure research. This subject was brought out in detail by the numerous instructive addresses by authorities in the field during the three-day sessions. Typical of the many addresses were such ones as "New Developments in Synthetic Chemicals and Materials for Fuels and Lubricants," by Walter G. Whitman, of the Massachusetts Institute of Technology; "Methods Analysis Programs in a Chemical Industry," by J. R. Bailey, of E. I. du Pont de Nemours and Company; "Effect of Instruments for the Chemical Industries on Modern Industrial Chemical Development," by John J. Grebe of the Dow Chemical Company, and many others.

Motion pictures also had an important place in the exposition. No less than seventeen motion pictures on the manufacture of various products, including pulp and paper, were shown. Rhinelander Paper Company was the sponsor of an interesting movie entitled "Manufacture of Pulp and Paper." General Electric Company, E. I. du Pont de Nemours and Company, Norton Company, American Cyanamid Company, Corning Glass Works, and the International Nickel Company, Inc., were among those who provided interesting motion pictures for visiting chemists and guests.

Of particular interest this year was the exposition itself with its varied and colorful booths and displays of chemical products. The commercial exhibits occupied some 32,000 square feet of floor space. Over one hundred leading companies exhibited the latest in chemicals, chemical machinery and laboratory apparatus and chemical products. Some booths merely displayed and illustrated the company's products; others had operating exhibits, spectacular exhibits and educational exhibits.

Technicians, chemists, engineers and students clustered around the extensive array listening intently to the demonstrations, inspecting equipment and, of course, asking questions with a thousand and one different angles.

Probably the most colorful exhibit at the show was that of the Dow Chemical Company, Midland, Michigan, which exhibited in four booths its complete line of chemicals, ethers, resin, vat dyes, solvents, etc. Modern in appearance, the Dow exhibit was easily one of the outstanding presentations at the show.

One of the most extensive exhibits was that of the Podbielniak Centrifugal Super-Contactor Company, Chicago. This highly-complicated section contained a considerable number of pieces of apparatus including the company's automatic recording low temperature fractionation apparatus, precision high efficiency laboratory fractionating columns and standardized low temperature analysis strip charts.

Koppers Company, Pittsburgh, presented newly-developed commercial products of coal, the fluorescent properties of which were demonstrated by the use of ultraviolet light. An illuminated panel gave the onlooker a very clear idea of how a coke plant works.

Obviously, it is impossible to give detailed descriptions of all the many exhibits at the Chemical Show. Worthy of note, however, were those of the Wilkens-Anderson Company, Chicago, featuring photoelectric colorimeters, spectrophotometers, *p*H electrometers; Sarco Company, New York City, featuring an entirely new steam and water mixing valve; Pfaudler Company, Rochester, New York, showing a complete glass-lined steel distillation assembly; Heil and Company, Cleveland, presenting acid-proof linings; International Filter Company, Chicago, showing improved silica and silica gels for vapor phase adsorption and catalytic acceleration of chemical reactions; Corning Glass Works, Corning, New York, displaying a new Nash glass centrifugal pump; Buffalo Foundry and Machine Works, Buffalo, New York, exhibiting latest developments in dryers, evaporators and chemical plant equipment; Barrett-Cravens Company, Chicago, showing lift trucks; and the American Foundry Equipment Company, Mishawaka, Indiana, demonstrating the cyclone dust collector.

The National Chemical Exposition was sponsored by the Chicago Section of the American Chemical Society. The committee which handled the annual affair this year, and which deserves full praise for its efforts, includes Dr. R. C. Newton, Swift and Company, chairman; R. E. Zinn, Victor Chemical Works; W. F. Henderson, Visking Corporation; Victor Conquest, Armour and Company; G. L. Parkhurst, Standard Oil Company; Dr. L. E. May, Sherwin-Williams Company; Professor C. D. Hurd, Northwestern University; Dr. H. E. Robinson, Swift and Company; W. M. Hinman, Frederick Post Company; Arthur Guillauden, Swift and Company; Dr. Robert Moulton, consulting chemist; Dr. E. H. Harvey, consulting chemist; Dr. R. H. Manley, Armour Institute, and Dr. L. M. Henderson, Pure Oil Co.

HOW PAPER MILLS HELP TO SELL LITHOGRAPHY

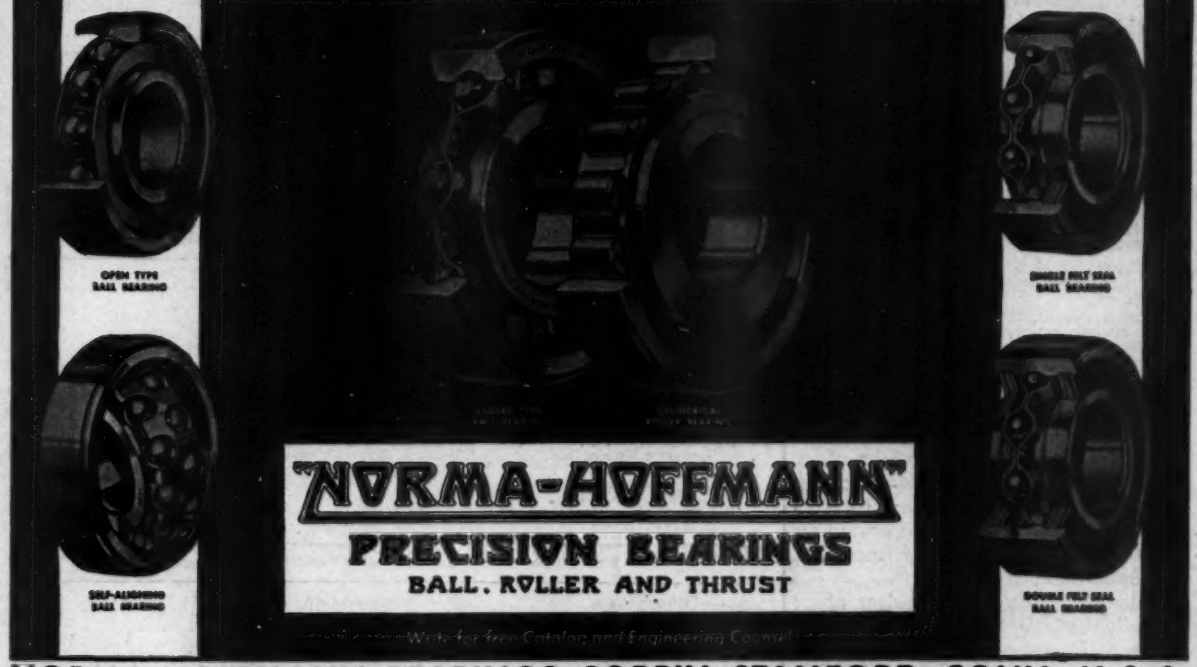
How the paper industry helps sales was brought out interestingly at a recent meeting of the Young Lithographers' Association held at the Advertising Club in New York City.

George G. Otto of the West Virginia Pulp and Paper Company opened the discussion by pointing out that making every effort to manufacture paper that lithographers can use profitably is probably the best way that his company could help lithographers. He stated that there are still a number of troublesome factors like wrinkling, curling, etc., which have to be eliminated.

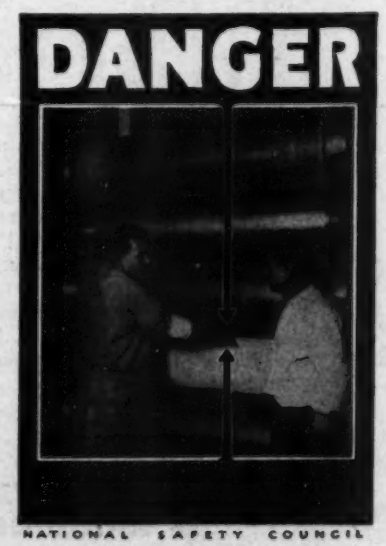
Osborne M. Curtis, Jr., of the S. D. Warren Company, talked on "What Paper Mills are Doing to Help Lithographic Sales," and pointed out that it was his belief that a three-way working partnership exists between the paper manufacturer, paper merchant and members of the graphic arts and that any effort on the mills' part to broaden the existing market, must be for the benefit of all concerned. Mr. Curtis then outlined how the Warren company goes about increasing lithographic sales with advertisements in national consumer magazines and trade journals of the advertising field, bulletins, etc.

Those interested in receiving a copy of the complete talks given at this meeting should communicate with the speakers direct, it was announced.

FOR MAXIMUM QUIETNESS AND ENDURANCE



NORMA-HOFFMANN BEARINGS CORP'N, STAMFORD, CONN., U.S.A.



New

ACCIDENT FACTS MEMO NO. PP2

NIP ACCIDENTS in the PAPER INDUSTRY

- **Principal Types of Equipment Involved**
- **Duties Being Performed When Injured**
- **Causes of Accidents; Personal, Mechanical**
- **Corrective Measures.**

This analysis of circumstances and causes of nip accidents is intended to furnish information on the important hazards and to guide accident prevention efforts. The information is useful in inspection and engineering work as well as for employee education and training, particularly foremen's safety meetings. This analysis is largely based upon reports from the Paper Industry Safety Contest. A copy will be sent FREE to any plant official or Safety Director by addressing the:

PAPER and PULP SECTION

NATIONAL SAFETY COUNCIL, Inc.

20 NORTH WACKER DRIVE CHICAGO, ILLINOIS

MICHIGAN TAPPI AND SUPTS. TO MEET JOINTLY

Michigan members of the American Pulp and Paper Mill Superintendents Association will have their sixth annual joint meeting with the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry on January 23. The meeting is to be held in the Columbia Hotel, Kalamazoo, Secretary-treasurer Glen Sutton has announced.

Featured speaker of the evening will be Dunlap C. Clark, president of the American National Bank of Kalamazoo. Mr. Clark will discuss "Industrial Expansion Under the National Defense Program." He served as a lieutenant during the first world war and is now a major in the air service. Mr. Clark has been long active in the affairs of the American Bankers Association and is a member of the Association's committee to promote co-operation between banks and industries on the financing of defense work.

Louis W. Sutherland, president of the Sutherland Paper Company, Kalamazoo, will be toastmaster at this meeting, to which national officers of both the Superintendents' Association and TAPPI have been invited. It is expected that Robert L. Eminger, secretary of the Superintendents' Association, will be on hand.

◆

MUCH OF INTEREST AT POWER SHOW

The 14th National Exposition of Power and Mechanical Engineering closed December 7 after a week packed with interest for executives, engineers and technical specialists allied with manufacturing and processing in all lines. Registrations at the Grand Central Palace in New York City, where the show was held, indicated an attendance equal to that of the last show when more than 40,000 visitors' names were recorded.

About 300 exhibitors displayed an array of approximately 1,200 products against colorful individual backgrounds, some of which included photomurals of plant interiors, dioramas or full-scale models or samples of products.

The theme of the show was "stepping up power production," and this idea was carried out by the exhibits, many of which disclosed plans for speeding up combustion, improving the steam rate or stepping up power factor.

The wide-spread interest in this year's show, it was indicated, was due to the fact that power plants are customarily designed with a view to expansion, creating a condition in the power plant field which is highly receptive to innovations.

◆

POWER CONFERENCE TO BE IN CHICAGO

The 1941 meeting of the Midwest Power Conference will be held April 9-10, at the Palmer House, Chicago. The conference, which offers an opportunity for all persons interested in power transmission, production and consumption to gather together for a study of mutual problems, is sponsored by the Illinois Institute of Technology and seven other midwestern universities and colleges.

The tentative program of the 1941 meeting, as outlined by the directorate of the Conference, includes sessions on central station practice, stationary prime movers and plant auxiliaries, hydro power, electric power transmission and distribution, feedwater treatment and industrial power plants. Joint luncheons are planned with the Chicago sections of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, an All-Engineers dinner, and inspection trip and a smoker.

Inquiries in regard to the conference may be addressed to Stanton E. Winston, Illinois Institute of Technology, 3300 Federal Street, Chicago.

◆

DATE OF THIRD PAPER FESTIVAL IS ANNOUNCED

The third annual Coastal Empire Paper Festival will be held at Savannah, Georgia, April 16-20, according to an announcement by the festival management. Held annually in the home town of the late Dr. Herty, developer of the process for manufacturing newsprint from Southern pine trees, the Paper Festival includes serious discussions of problems relating to the pulp and paper industry as well

The Paper Industry Safety Contest

July 1, 1940 to June 30, 1941

Out of 190 mills reporting for November, 24 have perfect record

PERFECT SCORES
Division I—Pulp and Paper Mills

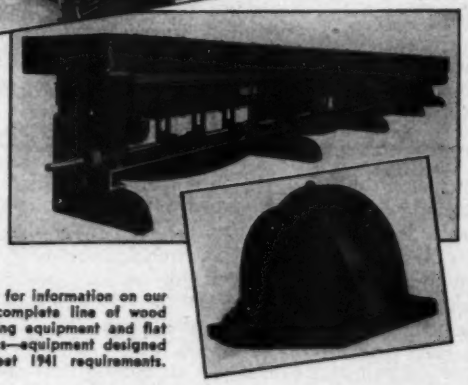
PARTICIPANT	MILL	LOCATION
GROUP A		
Anglo-Canadian Pulp & Paper Mills, Ltd.	Limoilou, P. Q.	Canada
Consolidated Paper Corp., Ltd.	Port Alfred, P. Q.	Canada
The Flintkote Company	Pioneer Division	Los Angeles, Calif.
GROUP B		
P. H. Glatfelter Company	Spring Grove	Pennsylvania
GROUP C		
Strathmore Paper Company	West Springfield	Massachusetts
Price Brothers & Co., Ltd.	Jonquiere, P. Q.	Canada
Strathmore Paper Company	Woronoco	Massachusetts
Rising Paper Company	Housatonic	Massachusetts
The Mead Corporation	The Harriman Co.	Harriman, Tenn.
GROUP D		
Bird and Son, Inc.	Phillipsdale	Rhode Island
American Writing Paper Corp.	Parsons Division	Holyoke, Mass.
American Asphalt Roof Corp.	East St. Louis	Illinois
United States Gypsum Co.	North Kansas City	Missouri
Hollingsworth & Whitney Co.	Abenaquis Mill	Madison, Me.
Spaulding Fibre Co., Inc.	Milton	New Hampshire
The Mead Corporation	Nashville	Tennessee
Central Fibre Products Co.	Vincennes	Indiana
Alton Box Board Co.	Carlyle	Illinois
Spaulding Fibre Co., Inc.	Hayes	New Hampshire
Division II—Paper and Board Re-Manufacturing		
Gaylord Container Corp.	St. Louis Container Plant	St. Louis, Mo.
Bird and Son, Inc.	Chicago	Illinois
Bird and Son, Inc.	Shreveport	Louisiana
Gaylord Container Corp.	Houston	Texas
Bay West Paper Company	Green Bay	Wisconsin

SUMMARY OF CONTEST EXPERIENCE

Division	Man-Hours Worked	Reportable Injuries	Frequency Rate 1940-41 (5 mos.)	Change from July-Nov., 1939
All Divisions	76,600,917	1,109	14.48	+ 1%
Paper & Pulp	60,360,010	1,014	14.62	+ 1%
Group A	45,624,202	570	12.49	+ 3%
Group B	13,135,632	224	17.05	— 5%
Group C	7,100,271	148	20.54	+11%
Group D	2,490,715	74	21.39	— 7%
Paper & Board Re-Manufacturing	7,240,907	95	13.12	— 2%

WOOD ROOM PAPER MILL EQUIPMENT

A complete line of Wood Room equipment, pulp mill flat screens, paper mill windershafts. Our engineering services are available to help you solve your Wood Room, pulp and paper mill problems.



Write for information on our new complete line of wood cleaning equipment and flat screens—equipment designed to meet 1941 requirements.

D. J. MURRAY MFG. CO.

WAUSAU, WISCONSIN

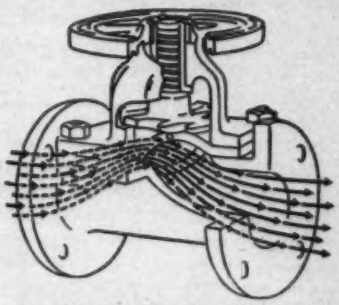
VALVES THE DIAPHRAGM TYPE

with the Streamline Flow

by **Hills-McCanna**

(Saunders' Patent)

FOR THE FLOW CONTROL OF BLEACH SOLUTIONS, PAPER STOCK, LIME WATER, COATING SOLUTIONS, ACIDS, CAUSTICS, ETC.



No pockets or parts for thru-put to accumulate in and cause operating difficulties.

There are many money-saving advantages which Hills-McCanna Saunders' Patent Valves offer over conventional plug cocks, globe or gate valves.

The two unit construction with the diaphragm seal protects all working parts from clogging and corrosion. The flow line cannot be contaminated. Once installed, the body need never be removed.

Bodies can be had in many special alloys, or lined with materials to match your pipe line construction.

Moulded rubber and synthetic rubber diaphragms now handle over 500 chemical applications, proven through years of actual industrial service.

Write for Bulletin V-40A

HILLS-McCANNA CO.

2433 NELSON STREET, CHICAGO

PROPORTIONING PUMPS - CENTRIFUGAL PUMPS - THERMOMETER WELLS - VALVES - FORCE-FEED LUBRICATORS - NON-FERROUS ALLOYS

FIGHT

KALAMAZOO
VEGETABLE
PARCHMENT

ONE

MORE

PARCHMENT
KALAMAZOO
MICHIGAN

ROUND

as entertainment and a carnival-like spirit of fun and frivolity. The date set for the festival is that period of the year when Savannah gardens are at their peak of beauty and the city's famous "streets of azaleas" are in full bloom.

◆

WASTE MATERIAL DEALERS PROTEST COTTON SUBSIDY

A brief expressing vigorous opposition to any permanent government subsidy on cotton to writing paper manufacturers was filed with the United States Department of Agriculture recently by Charles M. Haskins, managing director of the National Association of Waste Dealers, Inc.

The Association's protest, made public December 17 from its headquarters in New York City, originates from the plan of the Surplus Marketing Administration to develop the use of cotton in rag papers. Two years ago the administration granted writing paper manufacturers a subsidy of 50 per cent on 1,000 bales of cotton for experimental purposes and some 20 mills entered the tests.

With the tests regarded insufficient by the writing paper mills, J. B. Wyckoff, chief of the marketing division of the Surplus Marketing Administration, recently recommended that a 50 per cent subsidy on 7,500 of 10,000 bales be granted to continue the tests.

Mr. Haskins, it is reported, is willing to have this plan consummated provided he can get assurance that the subsidy will not become a permanent policy. He declared that with the exception of a few of the cheaper grades of cotton, particularly linters, it has been established that mills could not possibly use most of the grades of cotton on a permanent basis unless a continued subsidy were provided.

With the market for paper-making rags and cuttings already hard hit by the cessation of both imports and exports, Mr. Haskins pointed out, it would suffer further reverses if it had to compete with subsidized cotton.

CONVENTIONS AND COMING EVENTS

Jan. 23—American Pulp and Paper Mill Superintendents' Association (Michigan Section), Technical Association of the Pulp and Paper Industry (Kalamazoo Valley Section), Joint Meeting, Columbia Hotel, Kalamazoo, Mich.

Feb. 17-21—American Paper and Pulp Association, Annual Meeting, Waldorf-Astoria Hotel, New York City.

Feb. 17-20 — Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York City.

Feb. 17-20—National Paper Trade Association of the United States, Annual Meeting, Waldorf-Astoria Hotel, New York City.

April 1-4—Eleventh Packaging Exposition and Conference, Stevens Hotel, Chicago.

April 7-11—American Chemical Society, St. Louis, Mo.

April 9-10—Midwest Power Conference, Palmer House, Chicago.

April 16-20—Coastal Empire Paper Festival, Savannah, Ga.

May (1941)—National Association of Credit Men, Credit Congress, New Orleans, La.

AMERICAN STANDARDS ASSOCIATION

Members of the American Standards Association—representatives of trade, technical and governmental groups—met December 11 in New York City to hear Representative Hatton W. Sumners speak on "The Bearing of Standardization on the Co-operative Relations of Government and Industry," and to discuss activities of the Association during the coming year.

The defense issue was discussed and it was pointed out that the program requires activities in new fields, the expansion of existing work and increased activity on many of the projects now under way. It was announced that the Association had approved 73 standards during the year including specifications for materials, important safety codes, a dozen gas appliance standards and many standards in the mechanical and electrical fields.

◆

▸▸▸ RAYMOND D. GARVER, director of the Forest Survey, Forest Service in the United States Department of Agriculture, gives out the statement that full development of America's forest lands, represented by one out of every three acres in the United States, could provide work each year for two million additional men. Mr. Garver made this assertion in an address before the 40th annual meeting of the Society of American Foresters held in Washington, D. C., recently.

SUPPOSE heavy wrought pipe had been used in this installation. It would have weighed about twice as much as Taylor Spiral Pipe, and it would have cost about twice as much installed. Yet—as every engineer knows—heavy pipe would not be a bit more satisfactory for this job of white water pumping.

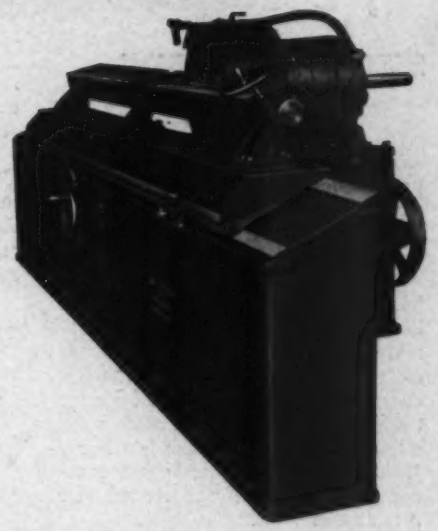
But why suppose? The simple fact is that heavy pipe has been used time and again where Taylor Spiral would handle the job at half the cost. The spiral seam in Taylor Spiral gives it high bursting strength, great resistance to collapse, and desirable rigidity. For all practical purposes the job is done as well or better than if pipe weighing twice as much had been used.

Next time buy pipe by rating—not weight—and watch your pipe costs come down. Taylor Spiral Pipe is easiest to install, easiest to remodel when conditions change. Taylor Light Weight Fittings and Fabricating Service are the answer to the most intricate layouts. Ask for details.

TAYLOR FORGE & PIPE WORKS
General Offices and Works: Chicago, P. O. Box 485
New York Office: 50 Church Street

TAYLOR *Spiral* PIPE

AUTOMATIC KNIFE GRINDING by COVEL-HANCHETT



Modern standards of precision demand increased accuracy and production. These advances have been built into Covel-Hanchett GK Knife Grinders by engineers with years of experience. Simple, heavy construction, fully automatic travel and feed, precision table ways that take up their own wear, optional hydraulic table drive or magnetic knife bars are a few of the solid values in this machine.

Controlled high production and long accurate life are the keynotes of Covel-Hanchett GK Knife Grinders. Full information on delivery dates, and complete details and specifications upon request. Write today.

COVEL-HANCHETT CO., BIG RAPIDS, MICH.

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest

Made by

DRAPER BROTHERS COMPANY
CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich.
W. L. CAMPBELL, Savannah, Ga.
C. K. BEECHER, Delaware, Ohio
O. J. LELOFF, Vancouver, Wash.

NAMES *in the* NEWS

Personals

SCHROEDER MADE PRESIDENT OF PEJEPSCOT CO.

Arthur Schroeder, formerly vice president of the Pejepscot Paper Company, has been elected president. Edgar Rickard, formerly president, is now chairman of the board.

Mr. Schroeder, whose ability is well known in the paper industry, started his career as office boy for the Pejepscot company and with the exception of a short period given to military duty, has given uninterrupted service to the paper company. He entered the sales department under the late Harry J. Northcott and was made sales manager in 1928. He was elected vice president in 1934.

◆

ACME STEEL CO. SHIFTS PERSONNEL

Due to the resignation of two of its officers, several important changes in executive personnel have taken place at the Acme Steel Company, Chicago.

James E. MacMurray, founder of the company with which he has been associated for more than fifty years, has resigned as chairman of the board but will continue as a member of the board of directors. Mr. MacMurray's place has been taken by Ralph H. Norton, president of the Acme organization who has been associated with the strip steel firm since 1904.

Succeeding Mr. Norton as president of the company is Charles S. Traer, who was formerly vice president in charge of production. In similar promotional moves, Chester M. MacChesney becomes first vice president and secretary; Carl J. Sharp, vice president, becomes director of sales succeeding Frederick C. Gifford who has retired, and Thornton A. Rand, formerly assistant secretary and assistant treasurer, is now treasurer and assistant secretary of the company.

It was also announced that John E. Ott has succeeded W. C. Childress as manager of the Acme Steel Company's Archer plant in Chicago. Mr. Childress, formerly in charge of production and engineering, has resigned.

◆

W. D. MURPHY LEAVES SLOAN VALVE COMPANY

W. D. Murphy, advertising manager of Sloan Valve Company and vice president of the National Industrial Advertisers Association, is now associated with Reincke-Ellis-Younggreen & Finn, Chicago advertising agency, in an executive capacity.

W. D. (Don) Murphy is the author of a series of articles now appearing in *Industrial Marketing* on the subject, "An Engineering Approach to Industrial Advertising." His writings have also appeared in other publications devoted to advertising and selling.

Mr. Murphy joined the Sloan organization in 1930, prior to which time he was connected with Stringer Brothers Company, Leffingwell-Ream Company, United States Steel Corporation and the Bethlehem Shipbuilding Corporation.

◆

▶▶▶ Now pulp mill superintendent of the Weyerhaeuser Timber Company at Everett, Washington, is *Russell LeRoux,* formerly with the Consolidated Water Power and Paper Company, Appleton, Wisconsin.

BRYANT NEW PRESIDENT OF AUSTIN COMPANY

George A. Bryant, executive vice president and general manager of the Austin Company, Cleveland, has been elected president and general manager of this national engineering and construction organization, succeeding the late W. J. Austin. Mr. Austin was fatally injured in the recent air crash at Chicago (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 942, Dec., 1940).

Geo. A. Bryant

A graduate of the University of Illinois, Mr. Bryant first became associated with the Austin Company as a field engineer 27 years ago on a building job in Alberta, Canada. He was named district superintendent of all Austin operations in New England in 1916. In 1918 he was made general sales

Acme Steel Company, Chicago, makes official promotions. Left to right: Ralph H. Norton, chairman of the board; Charles S. Traer, president; Chester M. MacChesney, first vice president and secretary; Carl J. Sharp, vice president and director of sales, Thornton A. Rand, treasurer and assistant secretary.

manager for the entire country, which responsibility he carried until early last year.

It was Mr. Bryant who, in 1929, negotiated the contract for a sixty million dollar Russian industrial city and generally supervised the design and erection of this project—reputedly one of the largest ever taken.

As general manager for the past eleven years, Mr. Bryant has had general charge of the design of buildings, making of contracts, securing of materials, and field construction operations.

◆

KVP'S 10-YR. CLUB WELCOMES 75 NEW MEMBERS

The Kalamazoo Vegetable Parchment Company held a party, on December 17, for employees who had just finished their tenth year of service with the company. About 175 persons attended the affair which has been staged annually for the past twenty years.

Seventy-five new members were welcomed to the Ten-Year Club of KVP by President Ralph Hayward and Jacob Kindleberger, chairman of the board. In addition to the ten-year group, there were two thirty-year men, Earl Boldman, superintendent of the wax department, and George Martin of the print shop service department. These two men were presented with gold watches.

On this occasion, the Ten-Year Club presented Jacob Kindleberger, founder of the company and chairman of the board, with a gold watch.

The ten-year men received their usual gift of a ten-year diploma, a KVP gold pin and a check representing two weeks' wages.

A turkey dinner, with all the trimmings, was served to all present, after which a musical program was presented by the Parchment Singers.

◆

▸▸▸ Effective January 1, 1941, *W. J. Lamory* was made superintendent of the Port Edwards (Wisconsin) paper mill of the Nekoosa-Edwards Paper Company. Mr. Lamory is the former general superintendent of the American Writing Paper Corporation at Holyoke, Massachusetts.

◆

▸▸▸ *Allen Abrams,* technical director of Marathon Paper Mills Company, Rothschild, Wisconsin, is now vice president of the company in charge of research and development. Mr. Abrams, who has been associated with Marathon for a number of years, was president of TAPPI in 1932 and 1933.

After thirty years they still keep up with the times. The watches displayed were given for 30 years of service with the Kalamazoo Vegetable Parchment Company, Parchment, Michigan. Not much need to say that the man in the center is Jacob Kindleberger, founder and chairman of the board of KVP. "Uncle Jake's" watch was presented to him by the Old Timers Club, and Earl Boldman (left) and George Martin (right) were presented with watches by the KVP company.

▸▸▸ *M. P. Hofmann* is now manager of research and sales of the C. O. Bartlett & Snow Company's new colloid mill department, it was announced recently. Mr. Hofmann developed special alloys of zirconium during the

M. P. Hofmann

last World War that were used by the Chemical Warfare Service in gas masks and following cessation of hostilities spent considerable time in colloidal research. He gained recognition in 1936 as the developer of the Manton-Gaulin two-stage mill.

RAMAGE RESIGNS FROM FRANKLIN PAPER COMPANY

James B. Ramage, formerly vice president of the Franklin Paper Company, Holyoke, Massachusetts, is now associated with A. L. de Olloqui of Holyoke, selling agents for H. Waterbury & Sons Company of Oriskany, New York. Mr. Ramage will cover the Middle West.

Mr. Ramage is the son of the late Charles Ramage and a grandson of the late James Ramage, one of Holyoke's first papermakers. A graduate of Dartmouth College, Mr. Ramage had been associated with the Franklin Paper Company for the past twenty years.

◆

KOTOK FOLLOWS E. W. TINKER IN FOREST SERVICE

Well versed in many phases of forestry work, Edward I. Kotok, director of the California Forest and Range Experiment Station of the Forest Service, U. S. Department of Agriculture, is now an assistant chief of the Service in charge of the branch of State and Private Forestry. Mr. Kotok succeeds E. W. Tinker who resigned over a year ago to become executive secretary of the American Paper and Pulp Association.

Mr. Kotok will direct a number of

co-operative programs now under way between the Federal Forest Service and State and extension foresters to improve forest management, fire control and forest planting in the various states. The State and Private Branch has been in charge of the New England Emergency Project, organized after the 1938 hurricane, and of the Prairie States Forestry Project which has supervised WPA projects that have established 13,600 miles of shelter belts in co-operation with 22,000 farmers. Mr. Kotok is well known also as the author of numerous scientific publications many of them relating to new developments which increased the efficiency of fire detection and control systems in California forests.

◆

IT'S "AUTHOR" KELLOGG NOW

Royal S. Kellogg, best known for his statistical ability in the newsprint field, recently won recognition for that ability in another field. In the December (1940) issue of *The Atlantic Monthly* there appeared an article entitled "How Much Did Your Car Cost?" the author of which was the able secretary of the Newsprint Bureau. Mr. Kellogg, with his usual statistical efficiency, presents in the article an interesting revelation on the cost of his automobiles on a mileage basis from records he had kept over a 25-year period.

Mr. Kellogg, it is recalled, has won distinction in still a third field—that of navigation. He is the owner and skipper of "Roon II," a 38-foot auxiliary ketch and has published various writings on yachting subjects and navigation. At present Mr. Kellogg is commodore of the Harlem Yacht Club, City Island, New York, one of the oldest yachting organizations in the metropolitan area.

◆

▶▶▶ Now a vice president of the General Electric Company is *Harry L. Erlicher,* purchasing agent for G-E since 1931 and associated with the firm for forty years. Mr. Erlicher began work with G-E as a messenger boy. In 1910, he was named a buyer, and in 1931 he was made general purchasing agent upon the retirement of L. G. Banker.

◆

▶▶▶ *Walter F. Hoffman,* formerly with the Northwest Paper Company, Cloquet, Minnesota, is now connected with the Fitchburgh Paper Company, Fitchburgh, Massachusetts.

▶▶▶ The appointment of *Clinton D. St. Clair* as works manager of the Manning, Maxwell and Moore, Hancock Valve Division plant in Boston, was announced recently. Mr. St. Clair, a graduate of Purdue University, has been associated with manufacturing for

C. D. St. Clair

the past 22 years and has been connected with such firms as B. F. Goodrich, Ohio Match Company, Erie City Iron Works and American Machine and Metals, Inc.

◆

▶▶▶ Winner of the Hydraulic Institute's first annual engineering essay contest was *I. J. Karassik* of the Worthington Pump and Machinery Corporation whose prize-winning essay was "Thermodynamics of Boiler Feeding." The contest was limited to the employees of the members of the Hydraulic Institute and the subjects covered a direct contribution to the pump industry.

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▶▶▶ Included among the speakers at the monthly dinner meeting of the Young Lithographers Association, January 8, in New York City, was *H. W. Blomquist,* of Harris - Seybold - Potter Company, who discussed the developments in the sheet fed offset press field and what they mean in the way of new markets.

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▶▶▶ *L. L. Smith,* associated with the B. G. Goodrich Company since 1908, was elected treasurer of the company on December 17. Mr. Smith was assistant treasurer of the Akron (Ohio) organization prior to his recent election. *George W. Vaught,* who has served as treasurer of the Goodrich company as well as vice president, will continue in the latter capacity.

COTTRELL PROCESS OF
ELECTRICAL PRECIPITATION

universally recognized as a
standard method of removing

DUST, FLY ASH, FUME, MIST & FOG
from GASES

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28 years of research development and operating experience by the affiliated Cottrell Companies throughout the world is incorporated in the

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offered to meet the requirements of any problem by

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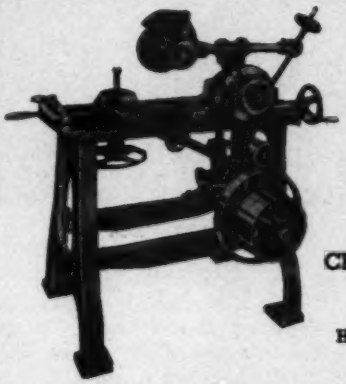

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PARIS II BLACKS
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PARIS II BLACK
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MANUFACTURER DISTRIBUTOR

GOODRICH 20-YR. CLUB INCREASES

A total of 2,656 employees have been with the B. F. Goodrich Company more than twenty years, it was revealed recently. The total was reached during December when John L. Collyer, president of the rubber company firm awarded 76 employees their 20-year service emblems at the pin presentation ceremonials of the Twenty Year Service Club in Akron, Ohio.

It was noted that in addition to the 2,656, there are 325 who have also served more than twenty years but who are now retired. Of the present number of twenty-year employees, two have been with the company more than fifty years, 26 more than forty years, 280 more than thirty and 2,348 more than twenty years.

◆

▶▶▶ Formerly associated with the Iroquois Paper Company, Thompson, New York, *Robert E. Burkhardt* is now with the Schroon River Paper Company, Warrensburgh, New York.

◆

▶▶▶ New president of the American Society of Refrigerating Engineers is *L. L. Lewis,* vice president in charge of engineering at the Carrier Corporation and an early pioneer in air conditioning. Mr. Lewis was elected president at the 36th Annual Convention of the Society, December 5, in New York City.

◆

▶▶▶ *R. E. Zimmerman,* vice president of the United States Steel Corporation, is now president of the American Standards Association. Mr. Zimmerman has served as vice president of the Association since 1938 and has been a member of the board of directors since 1937.

◆

▶▶▶ A group appointed recently by Governor Saltonstall of Massachusetts includes *W. M. Crane III,* of the Crane Company, Dalton, Massachusetts. This body of men is to assist the Massachusetts Selective Service headquarters in the collection of information pertaining to occupational deferments.

◆

▶▶▶ *J. A. D'Aoust* of the J. R. Booth Paper Company, Ltd., Ottawa, Canada, is now secretary-treasurer of the Trades and Labor Congress of Canada, it was announced recently. The Congress is the federation of Canadian units of the international labor unions linked to the American Federation of Labor.

▶▶▶ *W. H. Feldman,* vice president in charge of sales at the Electric Machinery Manufacturing Company, Minneapolis, is now general manager of the company. Mr. Feldman, associated

W. H. Feldman

with the company for eighteen years, was formerly in charge of district sales at Cleveland and Chicago. He was elected a director of the firm in 1936.

◆

▶▶▶ *Johannes Westergaard,* well known in the paper industry as one of the important representatives of pulp importers, is now vice president of Castle-Overton. He was formerly vice president of Atterbury Brothers.

◆

▶▶▶ *Russell Cooper* has resigned as general superintendent of the Quebec North Shore Paper Company to accept a similar position with the Powell River Company, where he will succeed the late *Grant M. Fowler.*

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We have recently compiled a series of performance reports from paper mills making a wide variety of stocks, showing what Magnus Beatex or other wetting agents have done to improve Beater operations.
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or one of a number of other materials especially compounded for this particular purpose (in view of the requirements of different kinds of stock) will give you materially improved beater performance. These materials make the water penetrate and open up the fibre bundles much more speedily and thoroughly. Formation is improved. Retention of filler and size is improved. When scrap paper is used, particularly containing wax or asphalt, these Magnus materials disperse wax and other "spot formers," keeping them so finely divided that this trouble is ended.
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Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.
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Magnus CLEANERS

Necrology

A. E. STALEY, SR.

August Eugene Staley, Sr., founder of the A. E. Staley Manufacturing Company, Decatur, Illinois, passed away December 26 at the age of 73. Mr. Staley was a pioneer in the corn and soy bean processing industry.

Beginning work as a North Carolina farm boy, Mr. Staley built a $20,000,000 industry. The plant at Decatur which processes soy beans into oil, meal, flour and other products is believed to be the largest of its kind in the United States.

Mr. Staley was a member of the Union League Club of Chicago and

several Decatur Masonic organizations. He is survived by two sons and three daughters.

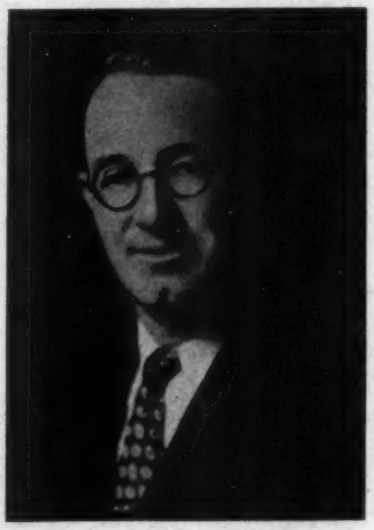
◆

▶▶▶ *Dr. Thomas S. Southworth,* until two years ago president of the Southworth Company, West Springfield, Massachusetts, passed away recently in New York City. He was 79 years old and leaves one son and two nephews, one of whom is Melvin Southworth, now president of his old company and Edward Southworth, secretary-treasurer of the company.

◆

CARLETON CURRAN

The pulp and paper industry is shocked to hear that Dr. Carleton E. Curran, one of the most brilliant and best known scientists in the field, passed away December 23 in Roches-



Carleton Curran

ter, Minnesota. Dr. Curran, chief of the Forest Products Laboratory's pulp and paper division, was 50 years of age.

Dr. Curran, a graduate of Wabash College, received his Ph.D. from Ohio State University in 1921. He came to the Forest Products Laboratory in Madison, Wisconsin, the same year following service as a second lieutenant in the Chemical Warfare Service and employment as an abstractor in organic chemistry for *Chemical Abstracts* and director of information for the Mead Research Company. He retained an associate editorship with *Chemical Abstracts* up to his recent passing. Recognition of his abilities resulted in his advancement to chief of the pulp and paper division of the Forest Products Laboratory in 1930.

Dr. Curran was known to his associates in the laboratory and to his friends and acquaintances in the pulp and paper industry as a thorough and brilliant scientist, an able executive, and an approachable co-worker in the field of his specialization. Under his direction the work of the pulp and paper division on semi-chemical pulping of hardwoods, production of white papers and newsprint from Southern pines, and improvements in the bleaching of pulp received wide recognition. He was the author of numerous publications on pulping and paper-making processes which appeared widely in United States and Canadian journals and which were re-printed in foreign publications.

Aside from his interest in the field of cellulose and pulp and paper, Dr. Curran was known to chemists for his interest in nomenclature. Outside this field he was a keen student of the economics of forestry and forest products. He was an active member of the American Chemical Society, the Technical Association of the Pulp and Paper Industry and the American Society for Testing Materials. Dr. Curran is survived by his widow and one son.

◆

J. STIRLING GETCHELL

J. Stirling Getchell, founder of the advertising firm which bears his name, passed away December 17 at the age of 41.

Born in New York City, Mr. Getchell attended the Peddie Institute and was a member of the U. S. Air Corps during the world war. In the advertising field he was known as the coiner of the term "admaker," to describe the type of work he did for the promotion and sales of various types of products. Mr. Getchell was very well known in industrial advertising circles.

Surviving Mr. Getchell are his widow and two sons.

◆

JAMES A. CONNELLY

Members of the paper and pulp, and allied industries were shocked to learn that James A. Connelly, known to most of them as "Packin' Box Jim," was fatally injured January 7 in his small machine shop in Hamilton, Ohio. He was struck down by an assailant, whom authorities have identified as an employee, when trouble arose because the aged man discovered the employee had forged a check.

Mr. Connelly was 79 years of age. He attained fame as the inventor and sole manufacturer of the Connelly rotary frictionless packing box, and he had been decorated by the Japanese government for service in the machinery designing field.

FRED R. DAVIS

Fred R. Davis, widely known advertising man and one of the founders of the Audit Bureau of Circulations, passed away December 26 following an illness of two years. He was 64 years old.

Aside from his A.B.C. activities, Mr. Davis was an advertising specialist for the General Electric Company where for many years he supervised the expenditure of more than a million dollars annually for newspaper and magazine advertising space.

A native of Adams, Massachusetts, Mr. Davis attended Union College, Schenectady, New York, and was graduated in 1900 from Worcester Polytechnic Institute. He began work with the General Electric Company in 1893 and in 1902 went to Fort Wayne, Indiana, as manager of the publicity department. In 1905 he returned to

Fred R. Davis

Schenectady to become assistant to the advertising manager of G-E.

Besides helping found the Audit Bureau of Circulations in 1914, Mr. Davis served as a member of its board of directors from its start until his passing. He was third vice president from 1922 to 1927 and first vice president from 1927 on.

Mr. Davis' work made him one of the most well-known men in advertising. Besides purchasing all the space placed by the Schenectady G-E organization, he also had the assignment of recording and cor-ordinating that placed by the Cleveland and Bridgeport divisions. In 1927 and 1928 Mr. Davis shared in the awards of the Shaw Publications for the best manuscripts on the solution of an industrial problem by advertising.

Surviving Mr. Davis are his widow, a son and two brothers.

Convention Papers . . . Abridged

The Operation of Sulphate Pulp Recovery Units on Soda Ash-Sulphur Mixture

W. F. GILLESPIE, Technical Director
Gaylord Container Corp. (Mill Division)

One of the large alkali companies has been experimenting for some time with a salt cake substitute—a combination of soda ash and sulphur.

Chemically, it is a mixture of soda ash and sulphur which has been sintered together to give intimate contact of its two main components.

A typical analysis of this product with Na_2O of 43.67 per cent is as follows: Na_2CO_3, 74.53 per cent; NaCl, 0.13 per cent; H_2O, 0.54 per cent; and S, 24.72 per cent. Comparing this with a commercial 97 per cent salt cake whose composition is: S, 21.8 per cent and Na_2, 42.4 per cent, it is evident an attempt has been made to obtain a mixture of sulphur and Na_2O in about the proportions of commercial cake.

The first commercial run on this material was made in the Gaylord Container plant at Bogalusa, La., when four cars of product were run as a test. All tests reported in this paper were run on the same B & W-Tomlinson 135-ton unit.

This preliminary trial was not a sucess, but we attributed the difficulties in a large measure to the physical characteristics of the material and it was decided to repeat our tests with a coarser granuled material.

The producers of the material experimented with the addition of the salt cake substitute by charging it in batches into the furnace in a number of mills and on various types of recovery units with satisfactory results.

Four cars were run as a test run on one B & W-Tomlinson furnace. Approximately 800-pound batches were shoveled into the rear door of the furnace every one-half hour. Approximately two minutes were required to charge the furnace. The furnace was put under vacuum of about 0.2 inch of water during charging.

General thermal conditions in the furnace during the test periods, when salt cake substitute was fed in the batch method, were very satisfactory. However, during the shoveling in of the batch, there was a decrease in steam production rate per hour from 10,000 to 28,000 pounds during the short time the door was opened, caused by a deficiency of primary air, influx of cool air through the back door, and the large amount of cake introduced.

We feel from the results of approximately 40 tests that soda losses are not any higher with this salt cake substitute than with the genuine salt cake.

The results show that the smelt produced from salt cake substitute runs has lower sulphide, sulphate, and total sulphur, and approximately the same polysulphide sulphur.

We believe there is no danger of a period where there will be a radical change in the character of the smelt. There does seem to be a building up of sulphur to a maximum and then a falling off. These variations are no greater than in normal recovery operation.

The Ultraviolet Absorption Spectra of Lignin and Related Compounds

RALPH E. GLADING
West Virginia Pulp and Paper Company

When a study of the absorption spectrum of lignin was being contemplated, it was recognized that the problem might be approached from two points of view:

(a) The absorption spectrum of native lignin could be determined, and the effect of introducing substituents into the lignin could be established by comparing the spectrum of native lignin with those of its derivatives. Then, if simple organic compounds could be found which showed the same change of absorption spectrum with the same type of substitution, the manner in which the substituents entered the lignin molecule could be established.

(b) If compounds could be synthesized which had structures similar to those proposed for lignin, their absorption spectra could be compared with that of lignin, and the evidence for or against certain proposed lignin structures would be strengthened.

The problem was attacked by determining the absorption spectra of native lignin, its derivatives, and other lignins isolated directly from sprucewood. The ultraviolet absorption spectra of carefully purified organic compounds known to contain groups present in lignin or known to have structures similar to those proposed for lignin were also determined. Interpretation of these spectra then was undertaken according to the principles mentioned under (a) and (b) of the preceding paragraph.

Absorption spectra of solutions were determined photographically, using a light source rich in ultraviolet light, a multistep sector photometer, cells for holding the solution and solvent, a quartz spectrograph, photographic plates, and suitable photographic processing equipment.

The compounds whose spectra were to be determined either were commercial preparations, purified by crystallization or distillation to a constant absorption spectrum, or were synthesized according to the methods described in the literature and purified to a constant absorption spectrum. The lignins were prepared and purified according to methods described in the literature, and were used without further purification.

The absorption spectra of almost all the lignins studied show an absorption band at about 280 mμ. This band persists in spite of such alterations in the lignin molecule as are caused by methylation, acetylation, or treatment with phenol, glycol, thioglycolic acid, sodium hydroxide, or sodium hydrogen sulphide. This fact suggests that the band at about 280 mμ is due to some configuration of atoms in the lignin molecule which is not disturbed by ordinary substitution reactions and which, in its absorption of radiant energy, is not influenced by the state or action of other portions of the molecule.

The question may now be asked, "What group or configuration of atoms is responsible for the lignin absorption band at 280 mμ?" It is the only clearly defined and persistent bank which the lignin spectra show. It is not affected by ordinary substitutions in the lignin molecule and has been shown to persist in lignins separated from wood by alcohols (Hägglund, Erik, and Klingstedt, F. W., Z. physik. Chem. 152A: 295-312 [1931] and Rassow, B., and Wagner K., Wochbl. Papierfabr. 63: 103-106, 161-164, 243-246, 303-305, 342-344, especially 161-164, 303-305 [1932]), alkaline pulping agents (Herzog, R. O., and Hillmer, Armin, Ber. 64B: 1288-1306 [1931] and Hägglund, Erik, and Klingstedt, F. W., Z. physik. Chem. 152A: 295-312 [1931]), acid pulping agents (Herzog, R. O., and Hillmer, Armin. Ber. 60B: 365-366 [1927] and Hägglund, Erik, and Klingstedt, F. W., Z. physik. Chem. 152A: 295-312 [1931]), and in chlorinated lignins (Stamm, A. J., Semb, Jos., and Harris, E. E., J. Phys. Chem. 36: 1574-1584 [1932]). Demethylation of Willstätter lignin with acetyl iodide has produced a material which does not have any maximum in its absorption curve.

This question is really only a part of the more general question "How can one account for the whole absorption spectrum of lignin—a sharply decreasing absorption coefficient between 220 and 260 mμ, a minimum absorption coefficient of about 1.45 at 261 mμ, an increasing absorption coefficient to the maximum, 1.63 at 281 mμ, and then a decreasing absorption coefficient toward longer wavelengths?" One answer to this question would be supplied if simple organic compounds having the same type of absorption spectra as lignin could be found, especially if these compounds were similar to those groups known to be present in lignin.

Attempts were made to explain the differences in the spectra of the various lignins and derivatives between 300 and 700 mμ, but, with the exception of the new band appearing in the spectrum of the phenylhydrazone

This is the third installment of abridgments of papers presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, held in Seattle, Washington, August 20-23, 1940. Previous installments appeared in the September and December, 1940 issues. A final installment will be published in February.

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Sterling Process for the De-inking of news.

Continuous cold water processes. Low conversion costs, small loss of fiber with no loss of strength.

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Have you a job open in your mill cleaning screen plates? By a method that can save you time and money? Then ask us about what so many mills say is the fastest, easiest way to handle this work.

Simply apply recommended Oakite cleaning solution with the Oakite Solution-Lifting Steam Gun. See with your own eyes how slime and other deposits are completely removed . . . in a jiffy! Yes . . . and at an amazingly low cost any mill superintendent would welcome!

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Write today for Naylor advantages found in no other light-weight pipe or send specifications for quotation.

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CELLULOSE PURIFICATION

of native lignin, the changes could not be interpreted on the basis of the present knowledge of lignin srtucture. However, certain observations may be recorded. The reaction of lignin with phenol, methyl alcohol, or alkaline pulping agents increases its absorption coefficients in the visible and near-visible regions. Diazomethane methylation of a lignin decreases the absorption coefficients in the neighborhood of 320 mμ. This prenomenon may be associated with the methylation of the phenolic hydroxyl group in the native lignin building unit, but confirming data on other compounds is lacking.

Application of Spectrographic Analysis to Pulp and Paper Problems

PHILIP NOLAN, Research Assistant
The Institute of Paper Chemistry

There are two general methods used in spectroscopic analysis: the method of emission spectra and that of absorption spectra. In the case of emission spectra, the basic principle is that all elements, when properly excited, emit light characteristic of the element and that the intensity of the light is proportional to the amount of material present. When one speaks of the emission spectrum of a compound, it is assumed that the character of the light emitted by the given compound as analyzed by means of a spectrograph is known. The sole function of a spectrograph is to separate the light emitted by a given element or compound into its individual component wavelengths and at the same time provide a photograph from which qualitative or quantitative estimate of the relative intensities of these several components may be obtained.

In the field of organic analysis, it is found necessary to study the absorption spectra of the compounds. This spectrum is defined by the curve showing the variation in the amount of light absorbed as a function of the wavelength throughout the range of wavelengths of interest. For example, ultraviolet absorption spectra would include a picture of the variation of the absorption coefficient for the range extending from 200 to 400 mμ, whereas the visible absorption spectra, which are responsible for the colors of materials seen in daily life, are described by the variation of the absorption coefficient from 400 to a little over 700 mμ. The infrared absorption spectra, then, comprise the data on the variation of the absorption coefficient from 750 up to 20,000 or more mμ.

Another spectroscopic method, which will become more valuable as time goes on, is that of fluorescent spectra determination. This is carried on at present from the colorimetric point of view: the color of the fluorescent radiation of given compounds is noted and taken as evidence of the presence or absence of given materials.

It will be found, generally, that it is necessary in precise analyses to use samples for calibration whose composition approximates those of the samples of interest. There are several methods used for purposes of calibration with the main objective of obtaining as precise an analysis as possible.

As far as the absorption spectrum analysis is concerned, the qualitative analysis consists mainly of the recognition of a certain characteristic shape of absorption curve as associated with a given compound. For the purpose of quantitative analysis of a pure compound, the absorption of a known concentration and a known thickness of the solution is determined, and the absorption coefficient per unit weight per unit thickness is calculated. The wavelength of maximum absorption and the maximum absorption coefficient generally constitute the data characterizing a given compound. However, the quotation of the absorption coefficient and the wavelength of maximum absorption are in general not sufficient for the unique analysis of a given compound. It is preferable to have the whole absorption curve available.

In order to carry out any of the methods of spectroscopic analysis, it is necessary to have a good deal of equipment. This equipment includes, in general, a spectrograph, a source for exciting the spectra in the case of emission spectrum analysis, a source of continuous radiation or a very dense line spectrum for the purpose of absorption spectra work, photographic plates, processing and developing equipment, a photometer, means for analyzing the plates, including some wavelength measuring device and a microphotometer for measuring the relative intensities of spectral lines, in addition to the personnel necessary to carry out the measurements.

There are two classes of spectrographs, the prism spectrograph and the grating spectrograph. In the prism spectrograph, the several wavelengths of an element are separated because of differences in speed of light of different wavelengths through the prism, whereas the separation in the grating spectrograph is based on the principle of interference. We have had good results in our spectrographic work using a B. & L. medium quartz spectrograph, as well as a model 2700 spectrograph for use in the visible spectrum range. For general purpose use, the large or Littrow model of the quartz spectrograph produced by B. & L. is more convenient than either of the smaller models mentioned above. Owing to progress made in the ruling of gratings, their use in spectrographs is increasing rapidly.

In addition to the source and spectrograph, there should be available a photographic dark room handy to the spectrograph. The generally recommended developers for photographic plates should be used, with added attention being paid to the requirements for extremely uniform development, especially in making quantitative analyses. Tank development, using an automatic rocking device, appears to be the best method.

In addition to the above-mentioned equipment, there should be available some type of photometer, such as a sector photometer, a wavelength comparator, and a microphotometer for use with spectral lines, either of the visual or photo-electric type.

For quantitative analysis it is also necessary to measure the relative intensities of certain chosen lines of a given spectrum. This measurement is made by means of a microphotometer or densitometer, which consists of a device arranged for measuring the amount of light transmitted through the developed image of a given spectrum line.

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TENAX FELTS

50TH ANNIVERSARY

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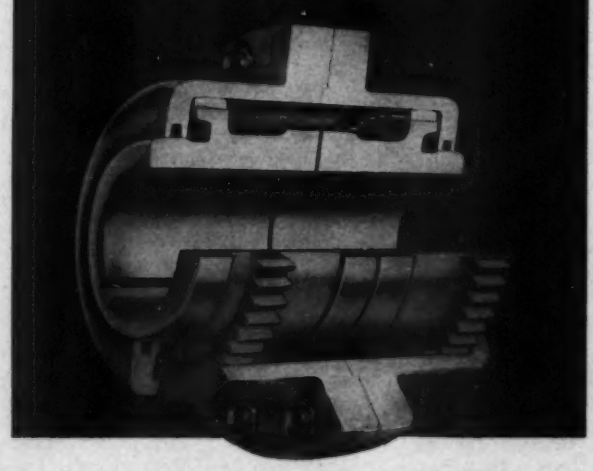

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With the Duriron Dissolved Alum System, the superintendent has exact control of the strength and amount of alum used. Space is reduced, size precipitation is better, specks and spots are eliminated, less alum is used . . . sizeable savings in dollars and cents.

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As in the case of chemical analysis, the field of spectrographic analysis may be broken into two main divisions: macroanalysis and microanalysis.

The general problem of impurities in pulp or paper, either of inorganic or organic character, offers a wide field for spectrographic study. The mose likely success is to be obtained in the field of inorganic impurities. These can be impurities in the sense that there is a rather high percentage composition of the given metallic elements, or the impurities may be present in amounts corresponding to traces which would be ordinarily overlooked in the usual quantitative or qualitative analysis. Another application of the method is to the analysis of paper and pulp for unusual constituents, as when a pulp or paper has been treated by some novel chemical means, in which case the problem will consist of the analysis for the compound employed.

In certain cases it is possible, using the method of absorption spectrography, to show the presence of an unusual organic compound. In employing the spectrographic method, one takes advantage of all the usual chemical techniques available in regard to differential solubility, precipitation methods, and the like in order to arrive at compounds and separations which will give greater meaning to the specificity of the spectroscopic analysis.

In the field of microanalysis as applied to paper, the problem of the determination of the composition of specks in paper arises with the objective of determining the source of the specks from the analysis. Here again the spectral analysis is intended to be a supplementary method to those usual microscopic methods which depend upon certain physical tests as well as reagent or microchemical tests for identification. The method has been carried out in detail for the analysis of the metallic components over a wide class of specks ordinarily found in paper.

The method of emission spectra analysis is readily applicable to the analysis of coating compositions as regards their elementary composition.

Another broad field of extremely useful application of spectroscopic methods is to problems of a photochemical nature. For example, in certain fading reactions it is often desirable to distinguish between the fading caused by certain components of a sheet. A striking example of this application was made in studying the spectral efficiency curve of the fading of groundwood. It was found that the spectral efficiency curve of the fading of groundwood closely parallels the spectral absorption curves of lignin, which, on the basis of general photochemical knowledge, indicates that the lignin was at least associated in the primary act of the photochemical reaction. Then again, on the basis of the spectral efficiency curve or the ultraviolet spectral absorption curve, one can understand the inversions that are observed between the rates of fading produced by normal sunlight and that produced by certain carbon arcs which are designed to approximate sunlight. It is on the basis of a study of the typical ultraviolet absorption characteristics of organic compounds that one can design compositions of coating materials for the purpose of minimizing fading or occurrence of rancidity in certain packaged materials.

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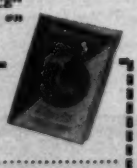

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The Chemical Composition of Balsam Bark

KENNETH D. HAY[1] and HARRY F. LEWIS[2]

A survey of the literature shows a great lack of information concerning the chemical composition of pulpwood barks from the point of view of the pulp maker.

Many of the materials isolated have been described in general terms, such as wax, pectin-like substances, fats, or hexosans, with little or no attempt to identify the particular material. Of the compounds listed, those most abundant in the nonaqueous extract include members of the higher alcohols, fats and fatty acids, resins, resin acids, resin alcohols, and waxes. Palmitic and stearic acid, and to a lesser extent oleic and linoleic acids are the most common fatty acids found.

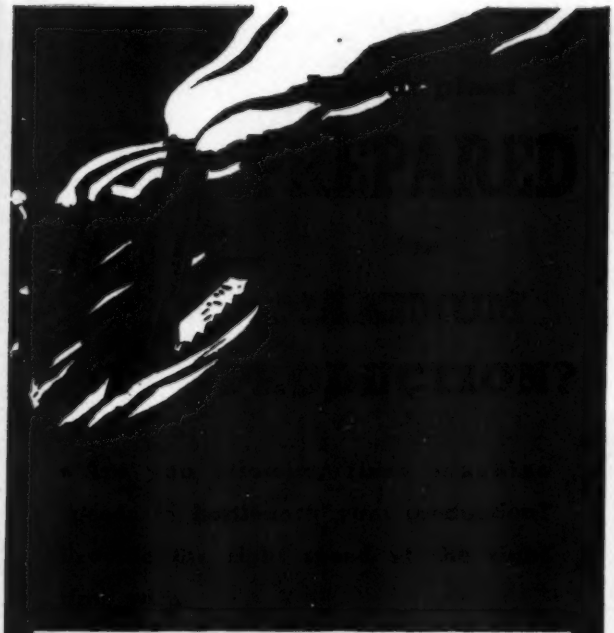
In the aqueous extract, tannins, nontannins, and sugars predominate. Among the hexoses, glucose, fructose, galactose, mannose, and rhammose derivative have been reported. The pentoses include only arabinose and xylose.

On the whole, the results have not been sufficiently comprehensive to permit any conclusions as to the distribution of various compounds among either the genus or genera of trees.

The literature survey indicates rather closely the scarcity of scientific data on the chemical composition of the barks of important pulpwood species. It has been the purpose of this investigation to present a rather comprehensive picture of the general components of one bark obtained as a by-product in a number of pulp mills in this country. The bark is that of the balsam tree.

The balsam tree (Abies balsamea) from which the bark sample was secured was a specimen freshly cut in the vicinity of Channing, Michigan. Its water content as indicated by the xylene method was 17.45 per cent. The moisture content, determined by heating to constant weight at 105 deg. C., was 19.5 per cent; the difference in weight

(1) Graduate Student; (2) Research Associate and Dean, The Institute of Paper Chemistry.



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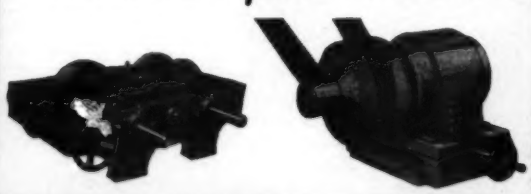

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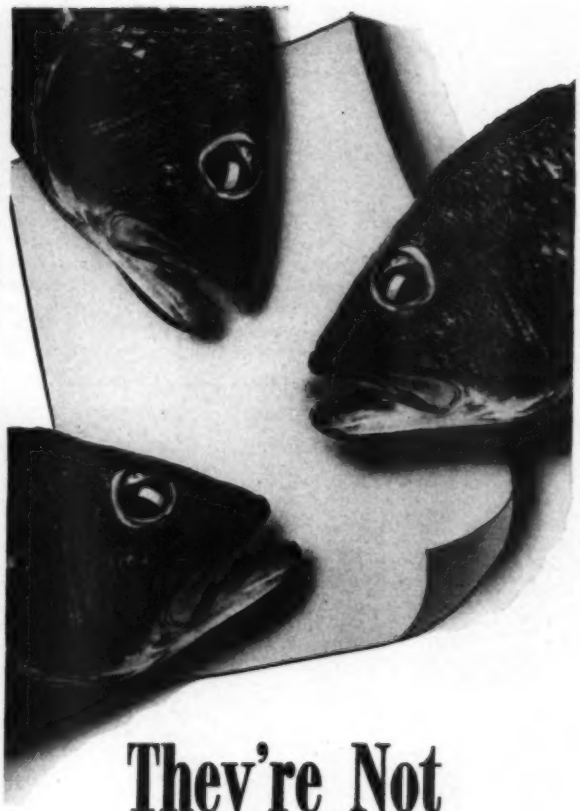

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loss came not only from moisture but also from the oils volatile at 105 deg. C.

Due to the presence of resins and oils in the bark, grinding to a fine powder was almost an impossibility. It was therefore first fed through a Williams hammer mill with ¼-inch screen plates in place. The coarse meal thus prepared was stored in wide-mouthed five-gallon glass jars with air-tight covers for later testing. The untreated bark was also stored in similarly covered containers. In each case, paper towels soaked with toluene were placed in the containers to reduce fermentation.

The amounts of material removed from the balsam bark by the various extractions (Kurth's method) have been summarized in Table I.

The residue remaining after the bark had been extracted with petroleum ether, ethyl ether, alcohol, and water was ground in a Bauer grinder until all had passed a 60-mesh sieve. The portion remaining on the 80-mesh sieve was used for analysis.

The following chemical constants were determined on this material: lignin, methoxyl in lignin, alpha-cellulose, beta-cellulose, gamma-cellulose, Cross and Bevan cellulose, pentosans, fermentable hexoses in the hydrolyzed bark, pentoses, and pectin material. Inasmuch as the analytical methods used are in general standard methods, no attempt will be made to discuss them in detail, other than to say that the lignin was determined by the 72 per cent sulphuric acid method, pentosans by distillation in 12 per cent hydrochloric acid and precipitation with phloroglucinol, alpha-cellulose by quantitative estimation of the material insoluble in 17.5 per cent caustic solution and beta- and gamma-celluloses on the filtrates from the alpha-cellulose by a volumetric method involving the use of potassium dichromate.

Table I—Amounts of Extractives

	Moisture-Free Bark, per cent	Refractive Index
Distillation with steam	0.8	.....
Ether extract	14.1	1.5190
Subsequent alcohol extract	2.3	.....
Susequent water extract (80-90 deg. C.)	14.3	.....
Water extract (boiling water)	17.3	.....
Petroleum ether extract	11.8	1.5148
Subsequent ether extract	2.1	1.4850
Carbon tetrachloride extract	13.5	1.5156
Absolute alcohol extract	15.2	1.514

When the ether-alcohol extracted bark was heated with water for approximately 24 hours, certain particles became covered with a clear, firm, transparent gel of considerable thickness. Extraction with further quantities of water for three to four days removed the gel completely. This gel gave a negative test for starch with iodine-potassium iodide indicator. Analysis of the nonsugar polysaccharides in the water extract of the bark indicated large amounts of polyuronic material together with some galactose, glucose, arabinose, and xylose. Such substances point to the presence of a gum, mucilage, or pectin-like material, any one of which would swell to give the gelatinous particles. The structure of the nonsugar polysaccharide as indicated by the substances present did not correspond to any common gum or mucilage.

The components found and calculated to the moisture-free bark include the following:

1) A small amount of oils volatile in steam.

2) Approximately 14 per cent of resenes, phytosterols, resins, and fatty acids. This fraction may have some interest as a characteristic oil to be added to soaps, talcum powders, bath salts, etc., or as a source of Canada balsam.

3) Slightly more than 2 per cent of alcohol-soluble tannins, phlobaphenes, and alcohol-soluble sugars.

4) Approximately 14 per cent of water-soluble salts, mucilage (or pectin), and carbohydrates. This fraction may very likely be responsible for occasional pitch troubles encountered when balsam is being cooked, for the mucilage is associated at least in part with stone cells, and these are penetrated but slowly by sulphite liquor. When they are present in the pulp by contamination of the wood with bark fragments, they may possibly swell in water to form transparent gelatinous specks in the paper.

The extractive-free bark makes up 68.5 per cent of the total moisture-free bark. It contains:

5) Cross and Bevan cellulose to the extent of 36.7 per cent of the moisture-free bark.

6) A fraction isolated as lignin amounting to 24.8 per cent of the bark. Since the methoxyl content of the lignin is only 11.8

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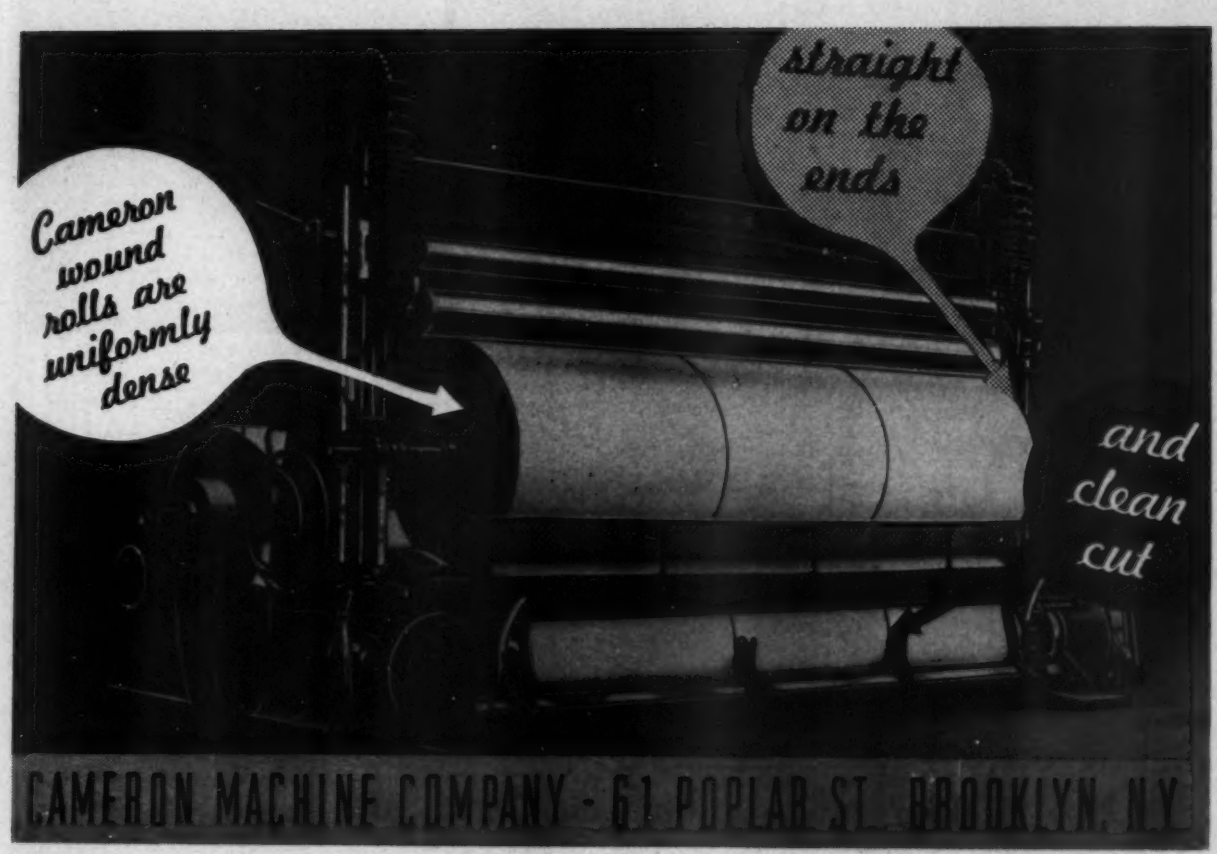
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per cent, it may be contaminated by other bark substances low in methoxyl, or else the balsam bark lignin is lower in methoxyl than balsam wood lignin. (This is not the case with one other coniferous lignin already investigated.) A methoxyl content of 14.3 per cent corresponds to four methoxyls per lignin unit of molecular weight of 870. A methoxyl content of 10.7 per cent indicates three methoxyls.

7) A pentosan content of 6.7 per cent.

The sum of the volatile oils, ether extract, alcohol extract, water extract, Cross and Bevan cellulose, lignin, and pentosans comes to 99.7 per cent. Undoubtedly there is duplication in the Cross and Bevan cellulose and pentosan values which would lower the total. In spite of this it may be stated that the major constituents of balsam bark have been identified.

Comparative Evaluation of the Different Methods of Dirt Count of Pulp

ALAN P. ADRIAN[1] and JOHN H. GRAFF[2]

Although there are many references in the literature to the analysis of specks and dirt in pulp and paper, there are only a few methods mentioned for systematically obtaining a dirt count of pulp. These are (1) the Clark method, now a TAPPI tentative method; (2) the Graff methods for handsheets and drier sheets, respectively; and (3) the method of Simmonds, Billington, and Baird.

(1) Graduate Student; (2) Research Associate, The Institute of Paper Chemistry.

The problem lends itself to two methods of approach: a laboratory method by which, as far as possible, the exact number, area, and kinds of specks per gram of pulp can be determined; and a method which can be used as a continual check during the manufacturing operation. If this latter method also gave an idea of the relative area and kind of specks present, it would be a much better method.

In developing a laboratory method which is reproducible and as free as possible from experimental and personal errors, the following points should be considered: the method of preparing the handsheets, such as sampling, disintegration, basis weight, and pressing of the sheets; the type of light box used, including type of illumination, distance of illumination from the sheets, and the height of the eye point above the sheet; the number of sheets to be counted for the least possible probable error in proportion to the time used; the frequency distribution of the relative area in square millimeter of the specks; and the kind of specks predominant in each area.

The method used for continual checks during the manufacturing operation where the number of dirt specks is determined directly from the lap or drier sheets must be reproducible, and as far as possible free from experimental errors and variations of personal judgment, and so arranged that it can be carried out in a minimum of time. The type of light box, kind and position of the illuminant, as well as the height of the eye point of the observer, are of importance. Here, as in the laboratory method, the number of test sheets, the areas and frequency distribution of the different areas of the dirt specks, and kind of specks in each group area must be considered, although to a more limited degree.

In preparing handsheets for the laboratory method of determining the relative amount of specks or dirt in pulp, the following factors are of importance:

The pulp must be disintegrated until it is completely defibrillated; beyond this point stirring has no influence upon the speck count.

The basis weight of the sheet must be heavy enough to stand handling and at the same time be as light as possible for a complete speck count; 37 pounds (24x36—500) seems to be the most appropriate.

The sheets should be subjected to pressure with felts between each sheet to obtain a smooth even surface. The specks are determined from the wet sheets by counting both sides of the sheet.

The kind of light and the distance of the light from the ground-glass plate in the box is of importance. Four 60-watt daylight bulbs give the highest count and 3.5 inches from the top of the light bulbs to the bottom of the ground glass gives the best illumination. (Work done with Weyerhaeuser box for speck count in the mill suggests that short daylight fluorescent tubes may be even better.)

The height of the eye point above the sheet is of great importance, not only for the uniformity of count but also for the relative number of specks observed and the frequency distribution of the relative square area of the specks. A chin rest located about fourteen inches above the sheet has been found to give the most desirable results.

The uniformity of counts obtained at different heights of the eye levels, counting a large number of sheets, shows that counts can be made with a percentage probably error of ±2.5 per cent, using eight sheets for the count and that nothing is gained by increasing the number of sheets beyond this number.

For a mill control method, the following points have to be considered:

The light box must be so constructed and placed that the speck count will not be influenced by external light conditions.

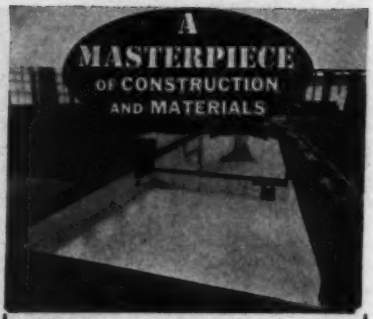
The lap sheets should be thoroughly wetted so that as many specks as possible can be seen with transmitted light and the specks on both sides should be counted.

The best type of illumination for this box was found to be two 17-inch, 15-watt daylight fluorescent tubes at a distance of 8 inches from the bottom side of the sheet, which produces a very even illumination and also prevents the sheet from drying out during the counting.

The best height of the eye point was found to be the same as for the laboratory method—using a 14-inch chin rest above the sheets.

One sheet 12 by 12 inches was found to be sufficient for a reasonably small probable error of the count.

The relative square area and a rough qualitative analysis of the most common specks in woodpulps can easily be determined with a shop microscope attached to a swinging telescopic arm over the opening of the light box.



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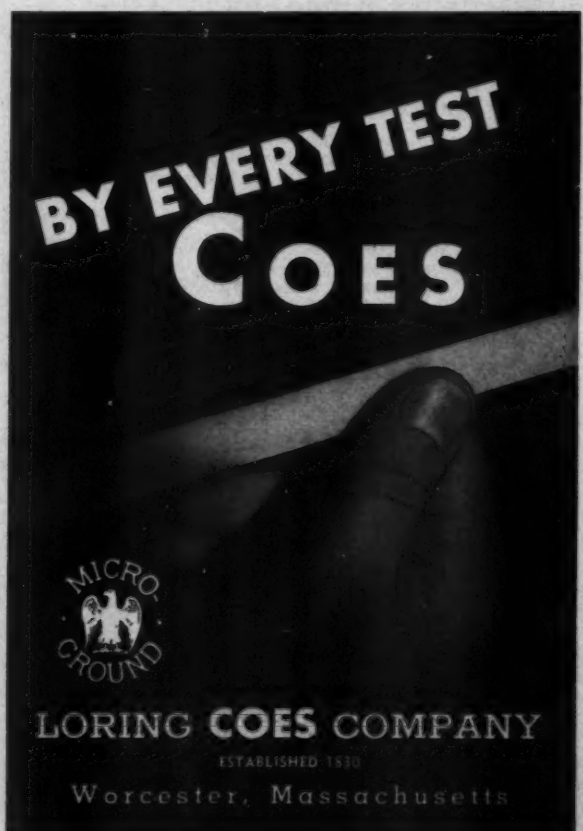

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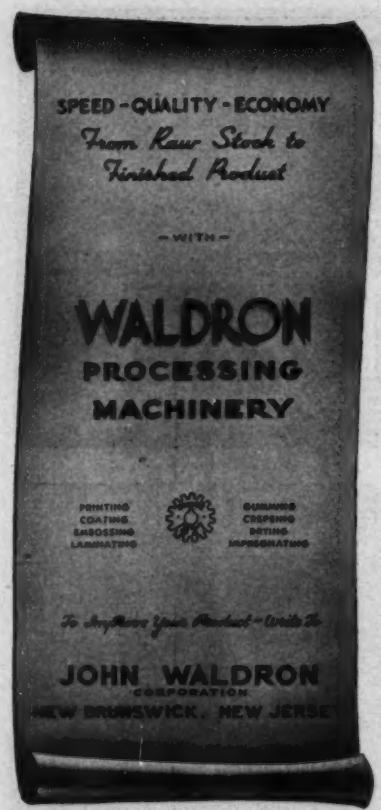
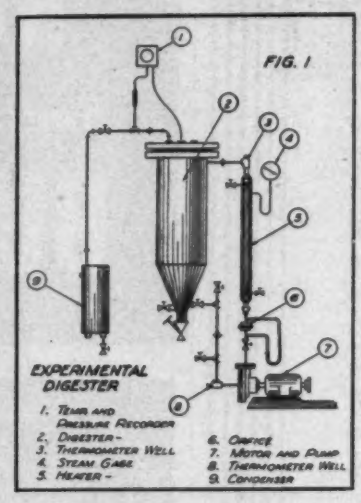


Heat Transfer Characteristics of an Experimental Indirectly Heated Digester

J. G. L. CAULFIELD[1] and
L. C. JENNESS[2]

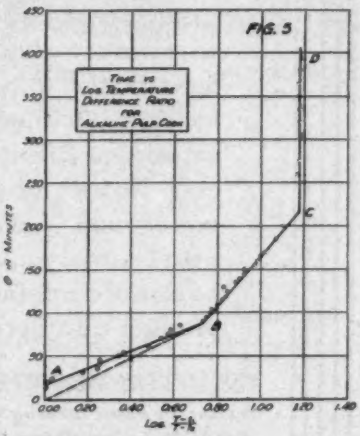
The apparatus employed was a small experimental digester of about two cubic feet capacity. The arrangement of digester, heater and accessories is shown in Figure 1. An orifice in the pump discharge line served as a means of measuring rate of flow, and thermometer wells were inserted near the pump intake and at the point where the fluid left the heater. Digester, pump and circulating lines were heavily insulated.



The heater consisted of a three-foot length of stainless steel pipe, standard one-inch iron pipe size, enclosed in a steam jacket made from standard two-inch iron pipe. Maximum liquid velocity through the heater was 2.1 feet per second at full pump capacity of 46.8 pounds per minute.

The experimental procedure followed consisted simply of taking simultaneous readings of temperature of the liquid at heater entrance and exit at five-minute intervals, while holding steam pressure and rate of liquid flow constant. Condensate from the heater was also weighed over five-minute intervals to determine the heat input to the digester, principally as a check on radiation losses.

Experimental data appear in Table 1. Over-all coefficients of heat transfer obtained from these data are shown in Table 2.



At low rates of circulation the temperature readings at the pump suction tended to lag for the first few minutes of operation, due to some time being required for

Table 1

Run No.	Initial Temp. deg. Fahr.	Final Temp. deg. Fahr.	Steam Pressure lb./sq. in.	Rate of Flow lb./min.	Weight of Water-lb.
1.	75	232	35	10.4	180
2.	109	236	40	19	190
3.	50	238	42	31.5	183
4.	84	219	40	31.5	185
5.	55	221	41	40.5	188
6.	84	229	40	46.8	70

Water equivalent of digester and fittings, 44 lb.

Table 2

Run No.	Rate of Flow lb./min.	Mass Velocity lb./sq. ft./sec.	Over-all Coefficient U, B.t.u./hr./sq. ft./°F. Based on Slope	Log mean Δ at	Theoretical Water Film	Per cent deviation from U based on theoretical water film
1	10.4	29.0	203	204	207	—1.9
2	19.0	52.8	282	284	299	—5.7
3	31.5	87.5	343	340	370	—7.3
4	31.5	87.5	341	335	370	—7.8
5	40.5	112.5	365	364	422	—13.5
6	46.8	130.0	410	414	474	—13.5

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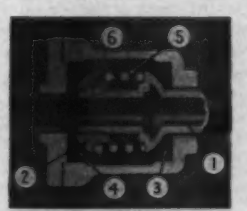

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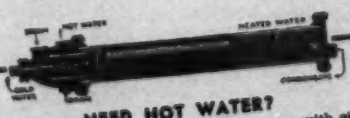

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the hot liquid entering the top of the digester to displace the cold liquid there.

Investigation of the coefficient of heat transfer to be expected in actual pulp cooking operations has been begun, but sufficient data has not been collected to warrant an extended report at the present time. In general, except that the value of the coefficient is lower, due to the properties of the fluid heated, the same principles apply as for water. A typical curve for a soda cook is shown in Figure 5. The time of cooking is divided into three distinct periods, represented on the graph as A to B, B to C, and C to D. The section of the line from A to B terminates at the boiling point of the caustic and covers the time required to heat liquid without change of state. Boiling liquid is being heated from B to C, while at C the over-all coefficient has ceased to increase and the existing temperature difference is just enough to overcome radiation and convection losses until the end of the cook is reached at point D.

(1) Assistant Professor of Pulp and Paper Technology; (2) Associate Professor of Chemical Engineering, University of Maine.

Recent Advances in the Chemistry of Lignin

F. E. BRAUNS, Research Associate
The Institute of Paper Chemistry

In the commercial production of pulp from wood and other plant materials, these materials are digested at elevated temperatures with either an acid or an alkaline hydrolyzing agent. In both cases the purpose of the cook is the dissolution of the lignin and other non-cellulosic materials. The lignin in coniferous woods amounts to about 27 to 28 per cent, whereas in deciduous woods it seems to be somewhat lower, varying from 12 to 24 per cent depending upon the method of determination applied. The non-cellulosic materials which also go into solution during the pulping process include some pentosans and hemicelluloses and amount to about 20 per cent. These non-cellulosic materials are also rendered soluble by a mild acid hydrolysis.

In recent years, confusion has penetrated the lignin literature because the term "lignin-building unit" is used with two different meanings. Based on a series of experiments with various lignin derivatives, Hibbert, Brauns, and co-workers proposed an empirical formula for a lignin-building unit with a molecular weight of around 840. This unit is distinguished by the presence of one phenolic and one enolic hydroxyl group. The existence of a lignin-building unit of this size has been further shown by Sarkar, Hägglund, Holmberg, and Freudenberg. Recently, however, Hibbert and his co-workers used the same term for a C6-C3 group of a molecular size of about 170, for which Freudenberg had introduced the term "lignin-building stone." In this paper, the term "lignin-building stone" will be used in Freudenberg's sense, for a C6-C3 group, whereas the term "lignin-building unit" will be used in the earlier sense—i. e., for a unit of 5 building stones with a molecular weight of about 840—in the same way as glucose is the building stone of cellulose and starch, whereas cellobiose and maltose are their respective building units.

A further proof for the existence of a lignin-building unit of a molecular weight of 840 is given by the studies of isolated native lignin—a lignin which has been isolated from spruce wood by extraction with an indifferent solvent at room temperature without the use of an acidic or an alkaline catalyst. Such lignin is obtained in a yield of about 2 to 3 per cent of the wood, or 8 to 10 per cent of the total lignin. It is obtained as a fine, very light cream-colored powder and has a methoxyl content of 14.8 per cent, which agrees exactly with that calculated for spruce lignin on the basis of the methoxyl content and the lignin of the wood taking into consideration the part of the methoxyl content which, according to Ritter is attached to carbohydrate material. This isolated native lignin gives all the typical lignin reactions, especially the brilliant purple color with phloroglucinol and hydrochloric acid.

Isolated native lignin is completely soluble in sulphite cooking acid and the lignosulphonic acid so obtained is now under investigation; it is hoped that more light will be obtained as to the actual reaction taking place between the lignin and the bisulphite. A number of theories have already been offered but they are without experimental proof. It is generally believed that sulphonation of lignin does not occur at temperatures below 100 deg. C. This is not true.

Whereas in the sulphite cooking process the carbonyl group plays an essential part, the reaction taking place in the soda and sulphate cook is still unknown. The study of the sulphite cooking process is facilitated because in this reaction a new element, namely sulphur, is introduced into the lignin molecule. In the reaction between sodium hydroxide and lignin, as used in the soda cook, it is difficult to decide whether the alkali has reacted with the lignin, and if so, in what way. Isolated native lignin is soluble in cold dilute sodium hydroxide and a study of the effect of sodium hydroxide on this lignin at higher temperatures is in progress.

In spite of the fact that sodium sulphide is used in the sulphate pulp industry to a large extent, the actual reaction taking place in this process is still unknown and the lignin from such a cook has scarcely been investigated. As sodium sulphide is an alkaline medium, it should react in a way similar to sodium hydroxide and, if an interaction between the lignin and sodium sulphide takes place, a lignin derivative containing sulphur may result and this may help to clear up the reaction.

The most important contribution to the solution of the structure of lignin made in recent years is the work by Harris who found that, on hydrogenation of lignin, 70 per cent of it is composed of C6-C3 building stones. The question, however, as to how these stones are linked together to form the lignin-building unit is still unanswered. This question will not be solved by theories based on assumptions but only by experimentally proved facts.

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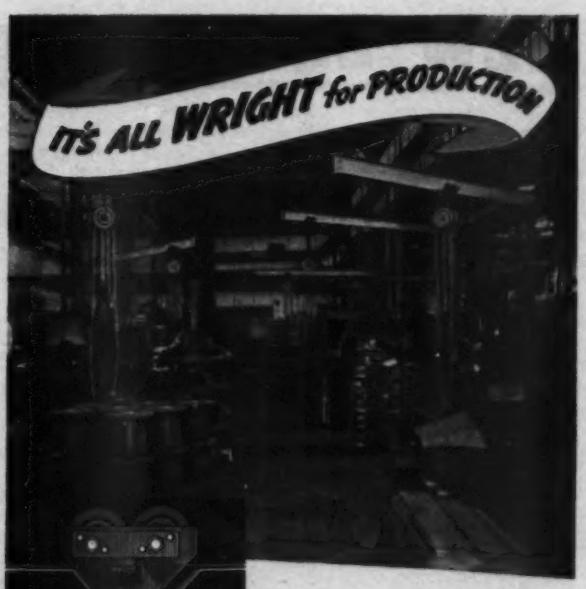

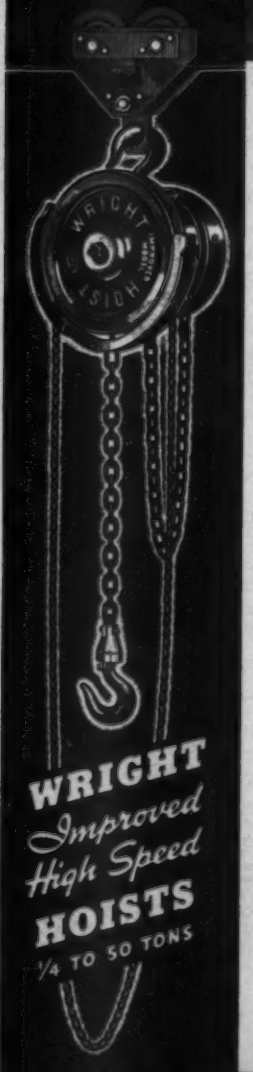

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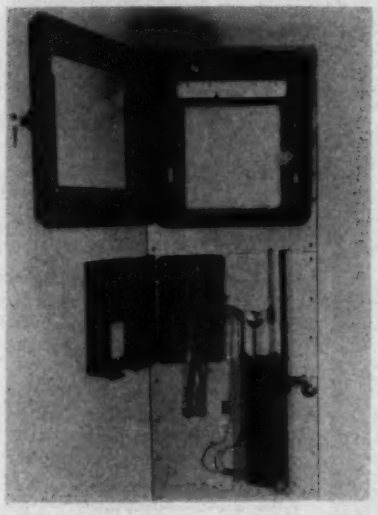
Dissolved Oxygen Recorder

Cambridge Instrument Company, Inc., Grand Central Terminal, New York City, has announced the development of a dissolved oxygen recorder for the use of operators of large steam plants. The instrument, which is completely automatic and which provides a continuous indica-



tion and record of dissolved oxygen entering the boiler, has a range of zero to one part of dissolved oxygen per 1,000,000 parts of water. It records upon a chart 10 in. wide. Readings of .01 part of dissolved oxygen per 1,000,000 parts of water may be determined readily.

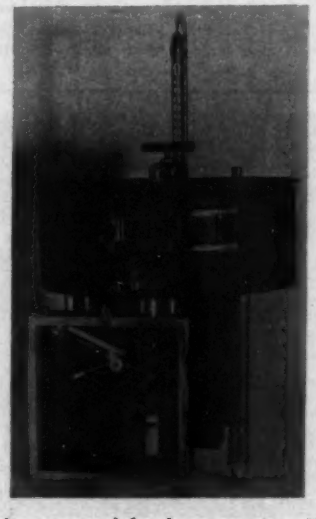
As shown in the schematic diagram, the water to be analyzed enters the cooler-regulator "A" where it is reduced in temperature and maintained at approximately 85 deg. Fahr. The constant head device "B" maintains the correct flow of water through the scrubbing tower "C" of analyzer unit "D". Hydrogen is generated in the electrolytic cell "E" and flows to the scrubbing tower where it comes into intimate contact with the sample water. The water dissolves some of the hydrogen and gives up part of its oxygen. The resultant mixture of gases diffuses to meter block "F" which contains the sensitive elements. The latter consists of four platinum spirals connected in the form of a Wheatstone bridge which are heated to a definite value by the current flowing through them. Two of the spirals are exposed to the sample gas and two are permanently sealed with saturated hydrogen. When pure saturated hydrogen surrounds the exposed spirals, the bridge is in balance and no deflection of the recorder occurs, thereby indicating zero oxygen. When the exposed spirals are surrounded by a mixture of hydrogen and oxygen their temperature will increase due to the lower thermal conductivity of the mixture. This causes a change in resistance of the spirals with a consequent unbalance of the bridge circuit. The deflection of the recorder is, therefore, proportional to the concentration of dissolved oxygen in the sample water passing through the scrubbing tower.

Semi-Automatic Moisture Tester

The Brabender Corporation, Rochelle Park, N. J., has announced a semi-automatic moisture tester with illuminated dial which shows moisture content of test samples directly in per cent. Among the important features of the tester are: insulated, circular drying oven containing a 750-watt heating element; spider-like aluminum platform arrangement within the drying oven; contact thermometer and a mercury relay; analytical balance, and the illuminated dial.

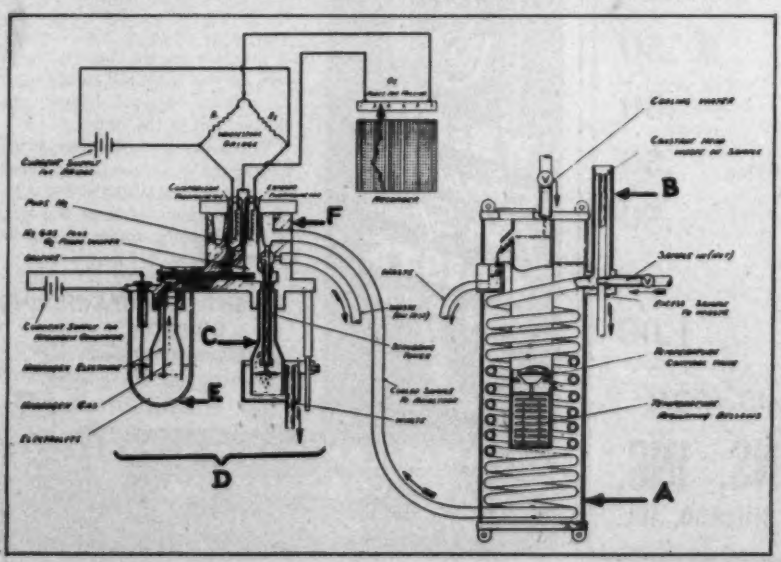
The 750 watt heating element is capable of bringing up the temperature of the oven to desired point in approximately ten minutes. The platform arrangement within the oven permits ten moisture tests to be taken at one time. The contact thermometer and mercury relay control the temperature within the oven to ± 0.1 deg. C. At the bottom of the chamber is an air inlet; on the top, three vents which allow moisture-laden air to escape.

The analytical balance and illuminated dial are fitted below the drying chamber.



Both are encased for dust protection. The balance has a sensitivity of ± .0025 gram.

In making a test, the sample is weighed on a special weighing-in scale (also supplied); then the dish containing it is placed in the drying chamber. At the end of the drying time, the analytical balance is released and the dish inside the drying chamber raised by pushing down a lever, thus permitting the weighing of the dish and sample without removal from the oven.



Oil-Resisting Caulking Compound

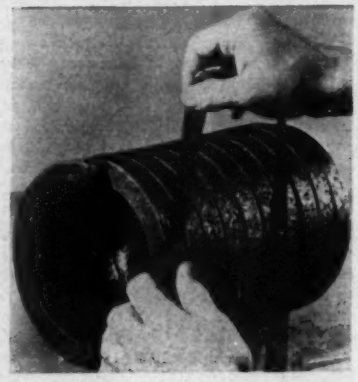
A non-hardening adhesive plastic compound which will not slump or flow and which remains workable over a wide range of temperature has been developed by the Johns-Manville Research Laboratories, 22 East 40th St., New York, N. Y., as a caulking material for transformer and oil switch bushings and covers. The material, designated as Petroseal, adheres to any clean, dust-free surface, yet can be removed and salvaged.

Process for Removing Silica from Water

The Permutit Company, 330 West 42nd Street, New York, N. Y., has developed a process for the removal of silica from boiler feed and process water. The process makes use of the silica-absorbing property of metallic oxide sludges. It can be used in connection with both hot and cold lime soda processes of water softening, and is adaptable to either new or existing equipment.

Plastic Packing

A plastic packing with reinforced tape vulcanized to outer surface has been announced by The Crane Packing Company, 1800 Cuyler Ave., Chicago, as a development in its manufacture of *Super-Seal* plastic packing. According to the manufacturer, the new packing is extremely pliable and can be bent around small diameter rods



and shafts without fracturing or cracking, or formed into small ID rings without distortion.

Super-Seal is a dry-graphitized plastic packing made from long-fibre asbestos, antifrictional metal particles and special binders. It is available in six styles and in sizes from ¼ in. to 1 in. graduated by sixteenths, in coils, standard length spirals or in die-formed rings or sets to stuffing-box dimensions. Recommendations of the manufacturer includes its use for packing centrifugal pumps, low pressure steam rods, valve stems, rotary pumps, and expansion joints.

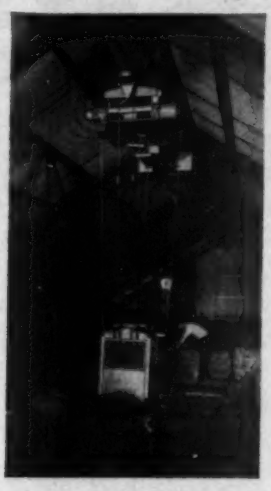
Portable Pipe Machine

The Oster Manufacturing Company, Cleveland, has announced an addition to its line of portable pipe machines. Known as the No. 502 *"Pipe Master,"* the machine is equipped with a sliding, floating type of die-head which is adjustable and quick opening. A cone fluted reamer is mounted

on the front of the die-head and integral with it. Standard cutter wheels and rollers are used by the cut-off device. On the rear of spindle is a three jaw centering device to assist front gripping chuck in centering longer lengths of pipe. A thread length gauge which can be set to insure duplicate, standard length threads is also part of the regular equipment.

Tramrail Carrier with Raise-Lower Cab

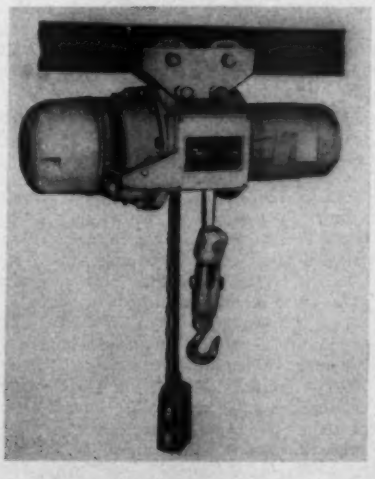
The Cleveland Tramrail Division of The Cleveland Crane and Enigneering Company, Wickliffe, Ohio, has announced the development of a new type of tramrail car-



rier with raise-lower carrier. Available in two general forms, this equipment in one form provides for the raising and lowering of cab and load together; in the other, for the cab and load raising and lowering independently of each other. The equipment is available for operation at various heights and speeds as required.

Air-Cooled Electric Hoist

The Yale & Towne Manufacturing Co. (Philadelphia Division), Philadelphia, has introduced an air-cooled, wire-rope electric hoist under the name of *"Load King."* This hoist is made in three types—lug, hook or plain trolley, with a choice of



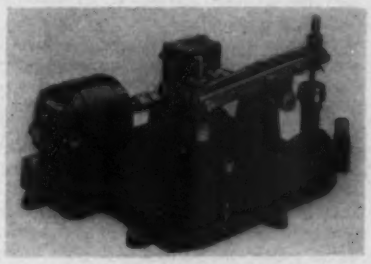
either right angle or parallel suspension, and in two capacities, ¼ and ½ ton. Among the features, cited for the new hoist, are: standardized interchangeability of repair parts, small overall dimensions, maximum use of ball or roller bearings and high overall efficiency.

Coating for Concrete or Wood Floors

Truscon Laboratories, Detroit, Michigan, has announced a new rubber base (chlorinated rubber) floor coating for concrete or wood floors. Known as *Paratex*, the coating, according to the manufacturer, does not react chemically in the presence of alkali and moisture; flows easily and brushes out nicely; will dry hard enough to walk on in a few hours (when drying conditions are good); will be oil and grease proof, as well as resistant to most chemicals in 48 hours; and is not affected by sunlight—therefore, may be used outdoors as well as indoors. Paratex is made in six standard colors, namely: tile red, stone gray, brown, concrete gray, green, and blue.

Chemical Proportioning Pump

Hills-McCanna Company, 2349 Nelson St., Chicago, has announced a proportioning pump of the constant speed, variable stroke type. Capacity variations in this unit are effected by means of adjustable plunger buttons, and range from a few drops per stroke (utilizing a 5/16 in. plunger) to as high as eight gallons per



hour (utilizing a ¾ in. plunger). The actuating mechanism of the pump embodies a balanced walking beam type rocker arm, hardened steel roller contact points, and Oilite Type bushings. Designed to operate at pressures as high as 1200 lb. per sq. in., the pump, designated as the *"R" pump*, can be had in single or multiple feed assemblies. Standard units can be had with one, two, three, or four independently actuated pumping units.

Paraffine Wax Emulsifier

A paraffine wax emulsifier, trade-named *NOPCO* 2251-B, has been announced by the Technical Service Bureau of National Oil Products Company, Harrison, N. J. It is a heavy, tan-colored paste, which, according to the manufacturer, when mixed with paraffine wax makes the wax water dispersible or emulsifiable.

Bearing Units Reclassified

Five different series of bearing units (Series 100 Ball Bearings, and Series 400, 500, 600, and 7200 self-aligning Roller Bearings) have been reclassified by Link-Belt Company, Indianapolis, Ind. The new classifications are: Flyweight for Series 100; and Welterweight, Middleweight, Heavyweight, and Alternate Heavyweight for Series 400, 500, 600, and 7200 respectively. The name given to the entire line is Link-Belt *Friction Fighter*.

TECHNICAL DEVELOPMENTS

The following abstracts are of the latest developments found in the foreign press.

Chemistry of Rapid Sulphite Digestion

The most important factor influencing reaction time is probably velocity of diffusion of the cooking liquor into the wood. Since the ideal wood should be one subdivided into individual wood fibers, Asplund fiber was used, despite the fact that only about 35% of this exists in the form of single fibers, with the greater part of it as fiber bundles. Sulphite digestions led to brittle stock from which hand sheets could not be made. This is in harmony with microscopic findings which in Asplund fibers show wide-spread physical and chemical degradation. The sulphate cook gives somewhat better results, but Asplund fiber is evidently an unsuitable material where high temperatures and pressures and acid cooking media are used.

This was shown in experiments in which ordinary chips were given a limited sulphite cook, then defibered in an Asplund defibrator, and then given the final digestion. A poor quality pulp was obtained. The reduction in strength was less marked when the sulphate process was used in place of sulphite digestion. The action of the defibrator is explained by assuming that the continuity of the interpenetrating cellulose-lignin system of the fiber is broken down by the mechanical action and the protective action of the lignin is removed in part.

Cooking acid having a pH as low as 2, where the lignin is being removed as lignosulphonic acid, gains access to the cellulose, which as long as it is being protected by the lignin and non-cellulosic polysaccharides is actually in contact with a weaker acid (pH 3-4) which does not hydrolyze the cellulose. If wood is subjected to high pressure, a marked improvement in diffusion velocity is noted. Wood, subjected to pressure under various conditions and digested by the sulphite process, yielded high alpha pulps with high viscosities if the reaction time was shortened to 65 minutes at a temperature maximum of 164 deg. By cooking for longer time periods at lower temperatures, wood subjected to pressure gave poorer quality pulps, and even short cooking periods at high maximum temperature gave pulp having low strength. These effects are less pronounced when the sulphate process is used (following pressure treatment).

An intact lignin system then seems necessary for obtaining a satisfactory sulphite pulp. This process is regarded as a topochemical reaction in which the following steps probably take place:—(a) formation of solid lignosulphonic acid; (b) hydrolysis of this acid and its solution at pH 2; (c) hydrolysis of substances accompanying the lignin and cellulose; (d) gradual degradation of the cellulose micelle (lowered viscosity) at pH 3-4; (e) direct attack on the cellulose chains by the cooking liquor after partial destruction of the lignin. The mechanical treatment of wood before cooking is important in determining pulp quality, and the amount of cellulose surface exposed to the cooking acid is a measure of the degree of acid attack. Fragmented chips or sawdust lead to weak pulp. When "perfect," sound chips were evacuated in acid-proof digesters prior to charging, complete diffusion resulted. The cooking acid used contained 5% total and 1.2% combined SO_2. Slow agitation was provided in a glycerin bath which covered the autoclave, and the maximum temperature was 170 deg. C. The digestion was then complete in about 1 hour, but when lower maxima were used, the cook was correspondingly longer. A pulp with as high as 92% alpha content can be obtained. Such an acid cook gives rayon pulps (hitherto unobtained) which have high alpha cellulose of low viscosity.

The method is not very suitable for paper-pulp production, although by proper modifications (lower maximum temperature) these pulps can be produced in rather short time periods. G. Jayme and L. Grögaard. Cellulosechem. *18*. No. 2, 34-48 (1940); Papier-Fabr. 38. 93-6, 101-8; 113-6 (1940) through Bull. Institute Paper Chem. *10*, 475; *11*, 105 (1940).

Hydrophylic Properties of Pulps

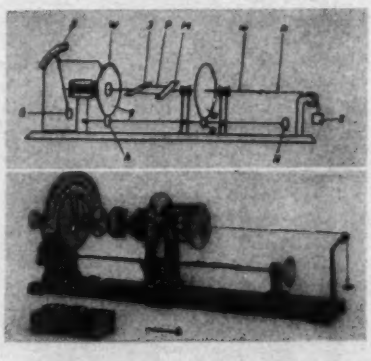
When pulp is methylated partially to a point where it contains 8-10% methoxyl it becomes slightly yellow but its hydrophylic properties are greater than those of the original. Its fibrous form is retained. Beaten methylated pulps gave test sheets the strength of which was greater than those made from the original pulp. Methylated pulp shows a greater water binding capacity. This was determined by finding the dielectric constant of dioxane which had been in contact with aqueous pulp suspensions. Methylated pulps took up 5.7% more water than did the original. The method gives a means for determining the changes taking place when pulp is dried. The water binding capacity of pulps is reduced by drying. As an example, pulp dried to 2.82% moisture could bind 8% of water. When the same pulp was dried to 0.47% moisture, only 4% water was bound. Methylated pulp dried to the same moisture content showed a greater water binding capacity than did the original. G. Jayme and D. Froundjian. Cellulosechem. 18, 9-12 (1940); through C. A. 34, 7602 (1940).

Manchurian Birch Sulphite Pulps

Cooking liquors containing magnesium bisulphite and approximately 3.8g total sulphur dioxide in 100 cc. were used in digesting Manchurian "Sirakanba" birch. Delignification occurred readily when low acidity obtained, but with difficulty in acid liquors. Solutions of high acidity lead to pentosan removal. With small amounts of free SO_2 in the liquor, the pentosan content was lowered from the original 27% down to 10%. The sulphurous acid consumed is about 10-12% of the weight of the dry sample. This consumption decreases with the acidity of the liquor. There appears a possibility that the unbleached pulp may be used for rayon manufacture. When cooking liquors of higher sulphite concentration were used (about 6g total SO_2 per 100 cc.) with 20-22% of SO_2 based on weight of the dry wood, there seems to be little difference in delignification with change in acid concentration. When small amounts of free SO_2 were present in these more concentrated liquors, the pentosan content of the pulp is quite high. The SO_2 consumption is 12-21% of the dry weight of the wood. Pulp thus formed is presumably suited to paper manufacture. Hotin Den. J. Soc. Chem. Ind. (Japan) *43*, (Suppl. binding) 174 (1940); through C. A. *34*, 7601 (1940).

Marginal Strength of Paper and Board

The author discusses theoretically the difference between resistance to tear *into* paper (*Einreiss widerstand*) and resistance to tear *through* paper (*Durchreisswiderstand*). The Elmendorf test does not gage the former but the latter (as shown by Brecht and Imset). The resistance to tear, depending on empirical hand trials, involves twisting or torsion. Fig. 1 shows schematically a Schopper torsional strength tester for the determination of marginal strength of paper, cardboard, films, etc. The instrument is also illustrated by Fig.



2. The test sheet (P) is clamped between (J) and (M), and the latter is given a rotary motion through gears (a) and (b). The angle of rotation of the sheet, which is kept under tension by (m), (n) and (z) is measured on scale (W). Clamp (J) is connected with the axis of revolution of a weighted pointer (G) which records the torsional moment on scale (S). From this the marginal strength may be calculated. No attempt was made to compute the specific marginal strength, since certain factors remain indeterminate. The original article has 13 illustrations. Alfred Schopper. Papier-Fabr. 38, 157-62 (1940).

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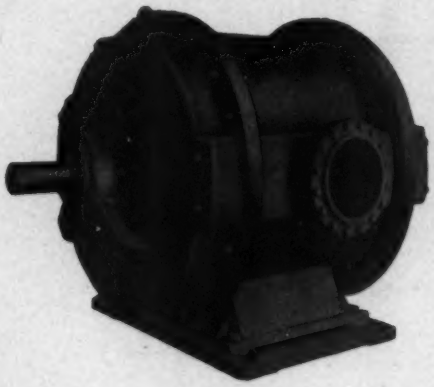

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Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

Paper Making Machine

Patent No. 2,200,002. Gerould T. Lane and Wendell Butterfield, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey. Application January 16, 1937, Serial No. 120,971. 10 Claims. (Cl. 92—43). In a paper making machine the combination with a vat, of a cylinder rotatably mounted therein, a making wire passing into the vat, around the cylinder and extending horizontally therefrom, deckle straps spaced apart and carried on the edges of the making wire, a vat circle extending around a large portion of the cylinder, a flow controller pivotally mounted adjacent the vat circle and including a curved face extending about a considerable portion of the cylinder, said curved flow controller including edge portions of different curvature connected to the curved face of the flow controller by spaced parallel walls spaced in accordance with the spacing of the deckle straps and being adapted to contact therewith, whereby the flow controller may lie partially between the deckle straps to control a relatively thin flow of stuff on the making wire as the same is lead horizontally from the vat.

Paper Roll

Patent No. 2,200,160. Charles Davis, Piedmont, W. Va., assignor to West Virginia Pulp and Paper Company, New York, N. Y., a corporation of Delaware. Application September 9, 1938, Serial No. 229,086. 1 Claim. (Cl. 206—59). A roll of coated paper having minute longitudinally extending irregularities in thickness or ridges characteristic of paper made in a continuous web, said roll having smooth ends substantially perpendicular to the roll axis and being tightly wound to prevent sliding of layers one over the other and of a size suitable for use in printing presses, said minute longitudinally extending irregularities in thickness or ridges in said roll extending along a uniform sinusoidal path and the corresponding ridges in adjacent layers being in offset or staggered relation to each other whereby such irregularities are to a substantial degree not directly superimposed so that distortion and stretching of the paper are avoided.

Process of Making Paper

Patent No. 2,202,717. Donald K. Pattilloch, Boston, Mass., assignor to Pattilloch Processes, Inc., Boston, Mass., a corporation of Massachusetts. Application March 20, 1936, Serial No. 69,844. 3 Claims. (Cl. 92—21). The method of making paper from fibre-water mixture containing negatively-charged colloids which consists in flowing the fibre-water mixture over electrically-charged anode and cathode electrodes and maintaining the fibre-water mixture in the electrified zone between said electrodes for a time period which is sufficient for the negatively-charged colloids to be attracted to the anode and to be discharged therefrom as positively-charged gel, but which is insufficient to permit any appreciable number of the cellulose fibres to be attracted into physical contact with the anode, whereby the positively-charged gel discharged from the anode unites with the negatively-charged cellulose fibre and becomes electrostatically bonded thereto.

Method of and Apparatus for Coating Paper

Patent No. 2,199,228. Noel Obenshain and Wright M. Welton, Piedmont, W. Va., assignors to West Virginia Pulp and Paper Company, New York, N. Y., a corporation of Delaware. Application July 16, 1936, Serial No. 90,832. 6 Claims. (Cl. 91—50). The method of coating a web of paper or the like, which comprises applying a coating composition comprising mineral pigments to a cylindrical surface having a multitude of liquid receiving indentations serving to hold a measured quantity of such composition, transferring a portion of said coating so applied to a second surface having resilient properties by maintaining said surfaces in rolling contact whereby said resilient surface receives a uniform amount of coating composition which is less than the amount initially present on said surface having indentations, then contacting said resilient surface with a web of paper or the like moving with respect to said resilient surface so as to occasion a substantial slip between said web and said contacting surface, while maintaining said web free to move slight amounts incident to variations in diameter and position of said resilient cylindrical surface.

Parchmentized Paper

Patent No. 2,207,122. Ralph A. Hayward, Parchment, Mich., assignor to Kalamazoo Vegetable Parchment Company, Parchment, Mich. Application August 25, 1937, Serial No. 160,733. 2 Claims. (Cl. 8—119). The method of making substantially smooth parchmentized kraft paper comprising the steps of subjecting a formed sheet or web of kraft paper to a parchmentizing solution, washing, creping the paper while wet, and drying while supported so as to permit shrinkage thereof and the absorption of the shrinkage by the crinkles produced by the creping step and their substantial elimination by such shrinkage.

Process for Purifying Wood Pulp

Patent No. 2,198,065. Lyle Melvin Sheldon, East Alton, and Lionel Elmer Goff, Alton, Ill., assignors to The Cellulose Research Corporation, East Alton, Ill., a corporation of Delaware. Application November 27, 1936, Serial No. 112,986. 2 Claims. (Cl. 92-13). In the treatment of wood for the production of cellulose derivatives the process comprising providing a bleached and purified wood cellulose having a soda soluble content of about 4% or less determined as that portion dissolved by boiling in 7.14% sodium hydroxide for three hours and an alpha cellulose content of 95% or over, subjecting said pulp to the action of a caustic soda solution of a concentration corresponding to about 13-15% at a temperature of the order of 25-30° C. for a time sufficient to dissolve the soluble non-alpha cellulose constituents and increase the alpha cellulose content to substantially 98% or over and reduce the soda soluble content and render the fibers highly swollen and porous, and then washing said pulp at a rate sufficiently rapid to remove the more dilute caustic concentrations below 7% in less than thirty minutes so as to maintain the highly swollen porous condition of the fibers in the washed pulp.

Sized Paper

Patent No. 2,204,612. Sidney Musher, New York, N. Y., assignor to Musher Foundation Incorporated, New York, N. Y., a corporation of New York. Application June 10, 1936, Serial No. 84,587. 5 Claims. (Cl. 91—68). A paper material which has been sized with a combination of 90% of paraffin and 10% cacao butter.

Method and Means for Coating Paper

Patent No. 2,204,600. Fred Kabela, Little Ferry, and George F. Whiting, Ridgefield, N. J., assignors to Lowe Paper Company, Ridgefield, N. J., a corporation of New Jersey. Application April 6, 1938, Serial No. 200,364. 10 Claims. (Cl. 91—55). The method of coating a continuous paper web to produce a smooth surface finish, which comprises applying a wet mineral coating to a face of the web, pulling the paper web forward around a smooth, round supporting surface, feeding into juxtaposed relation with the coated face of the web upon said smooth, round supporting surface a thin, freely flexible, pressing sheet of smooth, non-porous material, while maintaining the pressing sheet under tension to produce pressure of the pressing sheet against the coated face of the paper on the round supporting surface, the pressing sheet being more flexible than the paper web and being caused to follow all distortions of the paper web and its surface and to adhere continuously to said web, drying the coating and separating the flexible sheet from the coated face of the web.

Bleaching of Ground Wood Pulp

Patent No. 2,199,376. Joseph S. Reichert, Samuel A. McNeight, and Howard L. Potter, Niagara Falls, N. Y., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware. Application September 29, 1939, Serial No. 297,150. 8 Claims. (Cl. 8—104). A process of bleaching ground wood pulp which comprises contacting said pulp with an alkaline solution containing a peroxide at a temperature within the range 80 to 120° F., the pH of the mixture during the major portion of the bleaching process being maintained within the range 10.0 to 11.0.

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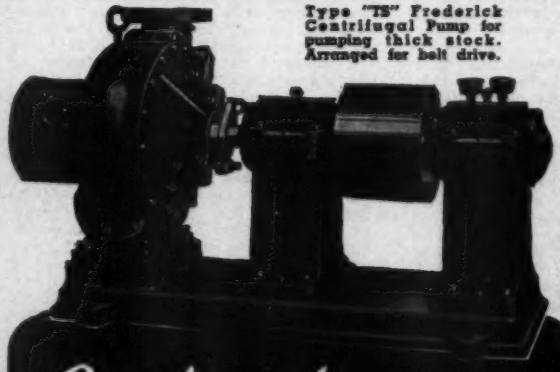

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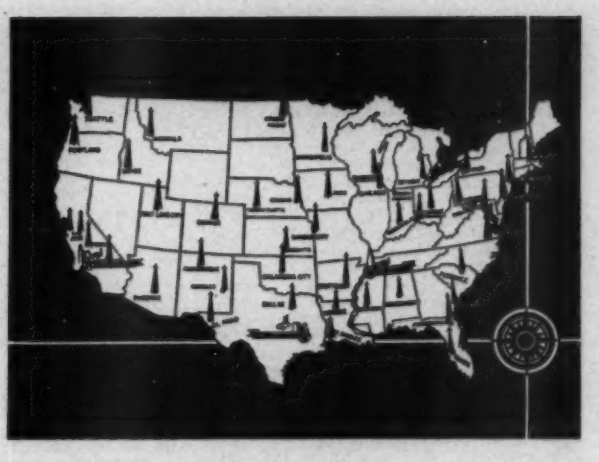

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New Catalogues and Publications

Alexander Brothers, Inc., Philadelphia—An interesting question-and-answer type catalogue (Form A-116) on this company's leather belting and leather products has been published recently. The catalogue, 32 pages in length, contains many illustrations and much written material relative to the company's various belts and other products. The material, both illustrative and written, is presented in a clear and readily understandable manner and there are several tables and other data which contain details as to thickness specifications, service correction factors, belt speeds in feet per minute, etc.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—Three new publications have been issued by this company. Bulletin B-6140 has to do with the company's new all-in-one "Electrifugal" pumps for 1 to 10 hp. inclusive and for heads up to 160 feet. Bulletin B-6107 is a 27-page release on Allis-Chalmers motors and contains photographs, data, specifications on squirrel cage, wound rotor, drip-proof, splash-proof, vertical, totally enclosed and other motors. This bulletin, punched for loose-leaf filing, contains considerable data relative to the products herein mentioned. Still another bulletin (B-6133) presents, in a dramatic manner, "Feedwater Facts . . . the story of Allis-Chalmers Akon Service." This bulletin has to do with the treatment and control of boiler water and by the use of splendid photographic work coupled with a well written presentation gives the reader a clear understanding of the service.

Buell Engineering Co., Inc., New York City—An unusually well-presented piece is a new publication entitled "Dust in Industry" which has been issued by this firm. Modern in appearance this release not only shows the results of careful effort as to physical preparation but also as to technical information. Many facts relative to the construction usages and applications of the dust collectors are included as well as extensive written material on such points as the problem of the "double eddy current," particle size analysis and the van Tongeren cyclone dust collectors.

Cameron Machine Co., Brooklyn, N. Y.—A new release (Form No. 18-438) describes and illustrates the "Camachine 18" winder. Illustrations and specifications of this unit are explained in the release.

Carbide and Carbon Chemicals Corp. (Division of Union Carbide and Carbon Corp.), New York City—A very attractive and comprehensive reference book "Synthetic Organic Chemicals," containing data on the properties and uses of 142 industrial organic chemicals has just been published by this company. The 96-page book, replete with data, includes six new chapters and contains information on 66 products not described in previous editions. Each synthetic organic chemical is classified and described in accordance with the characteristic group to which it belongs. The chemicals thus dealt with include almost every major family of organic chemicals including alcohols, glycols, ethers, oxides, alcohol-ethers, esters, ketones, aldehydes, acids, anhydrides, chlorinated compounds, amines, penetrants, "Carbowax compounds," synthetic resins, activated carbons and hydrocarbon gases. This book contains more than 45 tables containing useful information on gravity, viscosity, resin solubilities, etc.

Carrier Corp., Syracuse, N. Y.—Data concerning dehydration are explained in a four-page, two-color publication just announced by this company while the technical details are presented in a new specification sheet. Operation of the company's dehydrator for industrial air conditioning applications is described in the booklet with the aid of a diagram chart and cross sectional view of the equipment.

Chemical Publishing Co., Inc., New York City—The new 1940 catalogue of important technical and scientific books contains many new titles. Books of importance in all technical and scientific fields have been added to the previous standard and authoritative works. Engineers, chemists and technicians will be interested in this release.

Cleveland Crane & Engineering Co. (Cleveland Tramrail Div.), Wickliffe, Ohio—A new booklet prepared for those interested in the overhead method of materials handling has been released recently. The booklet features illustrations and captions on the company's variety of grabs and handling devices for many kinds of material including paper.

Cutler-Hammer, Inc., Milwaukee, Wis.—A new advance in motor control engineering—"Unitrol"—is covered in a new booklet just published by this company. The 35-page publication explains how the unit is used for standardizing motor control and illustrates construction and operating facilities. Specification data is included.

J. E. Day Co., Cincinnati, Ohio—Bulletin No. 353 recently issued by this firm has to do with chemical processing equipment. Included in this publication are photographs and explanatory material on the company's kneaders, mixers, agitators, gyrating screen, drums, kettles, mills, etc.

Economy Engineering Co., Chicago—Lifting and hoisting devices for use in factories, warehouses, stores and machine shops are shown in a new 32-page catalogue recently put out by this company. The publication contains views of portable and stationary lifters, fixed freight lifters and lifters with telescoping frames. Heavy four-post lifters for handling paper stock are also shown. Installation views throughout the book picture interesting applications of this company's lifters. Details of construction are explained and sample specifications are given.

Jeffrey Mfg. Co., Columbus, Ohio—This company has just issued a new bulletin (No. 749) on its screenings grinder for pulp and paper mill service. Brief written material presents various features of the equipment and photographs show inner construction and operating points.

Koppers Co., Pittsburgh—An attractive and informative little booklet entitled "Chemicals from Coal" is a new offering of this firm. The booklet lists and presents the properties and uses of various chemicals developed by the company from coal tar.

Link-Belt Co., Chicago—A new publication (No. 1775) on this company's anti-friction roller and ball bearings has just been published. The publication contains much data and numerous illustrations concerning "Friction Fighter Bearings," its 84 pages giving the complete story of their construction usages and adaptability. Complete tables of sizes, dimensions, weights and list prices are given as are tables of load ratings and minimum life expectancies. A number of pages are devoted to the selection of the proper unit for each class of service.

Mexico Refractories Co., Mexico, Mo.—A very interesting and attractive publication entitled "From These Hills," gives a very graphic account of the refractory industry in Missouri. The book, bound in bright yellow cord, contains much of interest concerning refractories including methods of production, securing the raw materials, etc.

New Jersey Zinc Co., New York City—*Paint Progress,* a publication distributed by this company, contains a very interesting and timely 7-page article entitled "Painting For Defence." The article contains much illustrative matter and reveals not only the volume of paint involved in national defense but also what paints will be used and where they will be applied.

Pfister Mfg. Co., Cincinnati, Ohio—A loose-leaf catalogue describing and illustrating the various types of fire extinguishers manufactured by this company has been released. Operating features are presented and price lists on parts are included. The release is well illustrated.

Roots-Connersville Blower Corp., Connersville, Ind.—This company has issued a new bulletin (21-b-35) describing the Victor-Acme rotary, positive blowers for handling small and medium volumes of air against pressure or under suction, ranging from 8 oz. to 7 lbs. per sq. in. The bulletin describes the operating principle of the two-impeller positive displacement type of blower and contains a table of ratings of the several different sizes.

Stephens-Adamson Mfg. Co., Aurora, Ill.—Catalogue 340 recently issued by this company is a 32-page presentation of this company's "Sealmaster" ball bearing units. This well-laid-out publication gives a general description of the product followed by engineering data, mounting instructions, lubrication and care data, load ratings and dimensional tables. Photographs showing typical applications are also included.

U. S. Dept. of Agriculture, Washington, D. C.—Photographs showing how some of the private timberland owners in the United States are keeping their lands productive are featured in a new publication, "Forestry on Private Timberlands," issued by the Forest Service. The cutting methods used by timberland owners whose properties are pictured in the new publication vary but, says the booklet, they are all designed to build up and maintain productive capacity of the forests while the merchantable products are periodically removed. The booklet (Miscellaneous Publication 381) can be obtained from the Department of Agriculture, Washington, D. C.

BOOKS

New Progress in Packing and Shipping Techniques—This publication consists of six papers, each of which were presented at the Packaging Conference of the American Management Association, March 26, 27, 28, 29, 1940, New York City. The authors and titles of their respective papers are as follows: Dr. F. C. Campins, National Starch Products, Inc.—Engineering Aspects of Adhesives; W. B. Lincoln, Jr., Inland Container Corporation—Protection in Shipping Container Design; David E. Moser, School of Business, College of the City of New York—The Essentials in Training Packers; George T. Henderson, The Hinde & Dauch Paper Company—The Technical Aspects and Characteristics of Linerboard; Marion A. Eyers, L. Bamberger & Company—The Receiving Clerk's Angle; and R. F. Tettemer, H. G. Hanline Company, Inc.—Shipping Department Accessories. Presented as Production Series Number 121, the publication is priced at 75 cents a copy by its publisher, American Management Association, 330 West 42d St., New York, N. Y.

Earlier publications of similar kind and on related subjects, published by the Association, are designated as Production Series Numbers 104, 108, and 115, and consecutively titled Shipping Containers and Closures, Techniques of Packing and Shipping, and Improved Methods in Packing and Shipping. Each of these publications, with the exception of Techniques of Packing and Shipping, is 75 cents a copy; while the publication constituting the exception is 50 cents a copy.

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In conjunction with the Dilts-Cowles Hydrapulper, in specially designed Hydracycle systems, or set up to meet your own mill requirements, the Hydrafiner "delivers" with a regularity that is creating a new era in stock preparation.

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DILTS MACHINE WORKS, Fulton, N. Y.
Division of The Black-Clawson Company, Hamilton, Ohio

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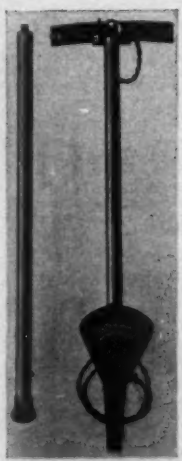

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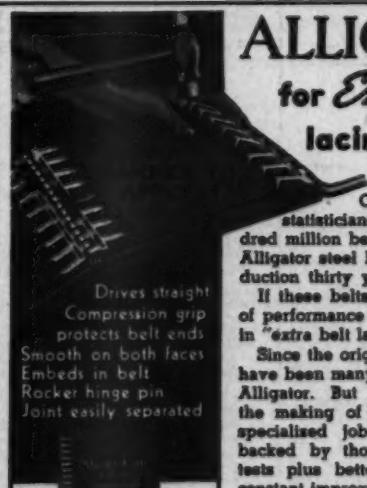

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NEW RAGS

	per cwt.
Blue Overalls	4.25 to 4.50
Corduroy	2.25 to 2.50
Cottons—	
Washables, No. 1	1.75 to 1.90
Fancy Percales	3.50 to 3.75
New Soft Blacks	3.25 to 3.50
New Light Seconds	1.60 to 1.75
New Dark Seconds	1.40 to 1.50
Khaki Cuttings—	
Mixed	2.50 to 2.75
O. D.	3.00 to 3.25
New White Canvas	7.00 to 7.50
New Mixed Blacks	2.25 to 2.50
Shirt Cuttings	
New White No. 1	6.50 to 6.75
Silesias No. 1	4.25 to 4.50
New Unbleached	6.25 to 6.50
Fancy	1.85 to 2.00

RAGS (Domestic)
f. o. b. New York City

OLD RAGS

	per cwt.
Roofing—	
No. 1	1.10 to 1.20
No. 2	.95 to 1.00
No. 3	.85 to .90
Twos and Blues—	
Repacked	1.60 to 1.75
Thirds and Blues—	
Repacked	1.35 to 1.50
Miscellaneous	1.10 to 1.20
White, No. 1—	
Repacked	3.00 to 3.25
Miscellaneous	2.50 to 2.75
White, No. 2—	
Repacked	2.50 to 2.75
Miscellaneous	2.00 to 2.25

RAGS (Foreign)
ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)
ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING
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	per cwt.
Gunny No. 1—	
Foreign (Nom.)	2.50 to 2.75
Domestic	2.50 to 2.75
Wool Tares—	
Light	2.50 to 2.65
Heavy	2.60 to 2.85
No. 1 Scrap Bagging	2.25 to 2.50
Manila Rope—	
Foreign	5.50 to 6.00
Domestic	5.50 to 6.00
New Burlap Cuttings	3.50 to 3.75
Jute Threads—	
Foreign	4.00 to 4.25
Domestic	3.50 to 3.75
Strings—	
Sisal	2.50 to 2.75
Soft jute	3.25 to 3.50
Mixed	1.10 to 1.25

WASTE PAPER
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	per cwt.
Shavings—	
White Envp. Cuttings	3.00 to 3.25
Ord. Hard White No. 1	2.25 to 2.50
Ord. Soft White No. 1	2.00 to 2.25
Soft White, Extra	2.50 to 2.75
Flat Stock—	
Stitchless	.85 to .90
Overissue Mags	.70 to .75
Solid Flat Book	.60 to .65
Crumpled No. 1	.50 to .55
Solid Ledger Books	2.00 to 2.10
Ledger Stock—	
White	1.60 to 1.70
Colored	1.15 to 1.25
New B. B. Chips	.30 to .35
Manilas—	
New Env. Cuts	2.60 to 2.75
New Cuttings	1.85 to 2.00
Sulphite Mill Wrappers	.30 to .35
No. 1 Old Kraft	1.10 to 1.20
News—	
No. 1 Wh. News Cuttings	1.50 to 1.65
Strictly Overissue	.60 to .70
Strictly Folded	.50 to .60
No. 1 Mixed Paper	.27½ to .23½

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	3.75–
Ground, cwt.	3.50–
Powdered, cwt.	3.90–
Blanc Fixe—	
Pulp, bulk, ton	35.00 to 40.00
Dry, barrels, pound	.0300 to .0400
Bleaching Powder—	
Drums, cwt.	2.00 to 3.00
Casein (Domestic Standard)—	
30-30 mesh (bags), lb.	13.00 to 13.50
80-100 mesh (bags), lb.	14.00 to 14.50
Argentine, lb.	12.50 to 13.00
China Clay—	
Domestic Filler	
Bulk (mine) ton	7.50 to 15.00
Domestic Coating	
Bulk (mine) ton	11.00 to 22.00
Imported (ship side)	
Bulk (lump) ton	15.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	1.75 to 1.90
Gelatine (silicin), lb.	.65 to .67
Glyc. (C.P.) drums, lb.	.1250 to .1300
Litharge, powd., bbl., lb.	.08
Rosin (Gum)—	
New York, per 100 lbs.	
E	2.07
F	2.08
G	2.18
WW	2.40–
Rosin (Wood), carlots	1.40–
Salt Cake—	
Dom. bulk (wks) ton	16.00 to 17.00
Imp. bulks on dock—	
(Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—Ammonia,	
Solid, drums, cwt.	2.30 –
Ground and flake, drums, cwt.	2.70 –
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.00
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.20
Starch—	
Pearl, 140 lb. bags, cwt.	2.95–
Pearl, barrels, cwt.	3.05–
Paper (Sp.) bags, cwt.	3.05–
barrels, cwt.	3.15–
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	14.00 to 17.25
Imp. bulk, ton (Nom.)	23.00 to –
Titanium Dioxide—	
Barium Pig., bbls., lb.	.03¼ to .05½
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.07¾ to .08

CHEMICAL PULP
(Air-dry ton)

	per cwt.
Soda (Dom.) del'd. mill—	
Bleached, contract	3.50 –
Open market	3.30 –
Sulphate (Dom.) f. o. b. mill—	
Bleached	4.00 to 4.25
Kraft No. 1	3.25 to 3.50
Kraft, Southern, del.	3.10 to 3.25
Sulphate (Imp.) on dock—	
Bleached	4.50 to 4.75
Kraft No. 1	3.50 to 3.75
Kraft No. 2	3.25 to 3.50
Sulphite (For.)	
On dock—	
Prime bleached	4.00 to 4.25
Prime easy bleach	3.75 to 4.00
Prime strong unbl.	3.25 to 3.50
Sulphite (Dom.)	
Bleached, contract	3.62½ –
Bleached, open market	3.62½ –
Unbleached, contract	3.17½ –
Unbleached, open market	3.17½ –

MECHANICAL PULP
(Air-dry ton)

	per ton
No. 1 Dom. & Can. (f. o. b. pulp mill)	34.00 to 37.00
No. 1 Imp. (On dock)—	
Moist	(nominal) 43.00 to 48.00
Dry	(nominal) 45.00 to 50.00

PAPER
f. o. b. New York City

	per ton
Boards—	
Binders	73.00 to 80.00
Chip	30.00 to 35.00
Chip, sgl. mla. lined	50.00 to 55.00
Coated, white patent	
.016	72.50–
.020 and heavier	67.50–
Kraft liner	55.00–
News	30.00 to 35.00

	per cwt.
Book (easel)	
No. 1 Glossy Coat	11.90 to 13.50
No. 2 Glossy Coat	10.25 to 11.75
No. 3 Glossy Coat	9.55 to 11.00
No. 4 Glossy Coat	9.15 to 10.50
No. 2 Offset	8.40 to 9.75
A Grade M. F.	6.75 to 7.25
A Grade Super	7.00 to 7.50
B Grade M. F.	6.30 to 6.80
B Grade Super	6.55 to 7.05
B. S. & S. C. Litho	6.80 to 7.30
B. M. F. Litho	6.55 to 7.05
Ivory & India	.50 cwt. extra

	per cwt.
Bonds (Rag Content)—	
100% Rag	
Ext. No. 1	39.10 to 46.00
100% Rag	31.05 to 36.50
85% Rag	
75% Rag	23.40 to 27.75
65% Rag	20.50 to 25.00
50% Rag	17.55 to 21.50
25% Rag	14.65 to 17.75
Regular Colors	1.00 cwt. extra

	per cwt.
Bonds (Sulphite)—	
No. 1	8.95 to 11.00
No. 2	8.05 to 9.75
No. 3	7.60 to 9.25
No. 4	7.30 to 9.00
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	
Embossed (25 lb. up)	13.75 to 14.00
Bleached (25 lb. up)	12.75 to 12.87½
Unbleach. (25 lb. up)	11.00 to 11.25
Greaseproof—	
Bleach. (25 lb. up)	10.50 to 10.75
Unbleach. (25 lb. up)	9.50 to 9.75
Ledgers (Rag Content)—	
100% Rag	
Ext. No. 1	40.25 to 47.25
100% Rag	32.20 to 37.75
85% Rag	29.90 to 35.00
75% Rag	24.75 to 29.00
65% Rag	21.65 to 26.25
50% Rag	18.70 to 22.75
25% Rag	15.50 to 19.25
Regular Colors	1.00 cwt. extra
Ledgers (Sulphite)—	
No. 1	10.10 to 12.25
No. 2	9.25 to 11.25
No. 3	8.50 to 10.75
No. 4	8.50 to 10.25

	per ton
News—	
Rolls (Contract)	40.00 to 50.00
Rolls (Spot)	(nominal)
Sheets	58.00 –

	per ream
Tissues (Carlots)—	
White, No. 1	.97½ –
White, No. 2	.75 to .77½
Anti-Tarnish M. G.	.80 to 1.05
Colored	.87½ to 1.10
Kraft	.85 to .90
Manila	.77½ to .80
Napkins, semi-crepe (12½ lb. to M shts.) per cs	.41 –
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.43½ –
Toilet, Bleached (M shts.) per cs.	5.80 –
Toilet, Unbleached (M shts.) per cs.	3.50 –

	per case
Towels—	
Bleached	3.10 to 3.65
Unbleached	1.95 to 3.30

	per cwt.
Wrappings (Kraft)—	
Extra Quality	5.25 to 5.75
Super-Standard	4.87½ to 5.25
Northern Standard	4.25 to 4.75
Southern Standard	4.25 to 4.75
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	
Bleached papers—	
M.F.& M.G. Waxing	
20 lb. (Carloads only)	6.40 to 6.80
(10,000 lbs.)	6.60 to 6.90
Drug wrapp. 35 lb.	6.00 to 6.35
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	4.50 to 4.75
No. 1 Butchers	5.00 to 5.12½
No. 1 Imit. Parch & Dry Fin.Groe.Sulphite 30 lb.	5.50 to 5.75
No. 2 Imit. Parch & Dry Fin.Groe.Sulphite 30 lb.	5.00 to 5.25
Steam Finish, 50 lb.	3.87½ to 4.00
Water Finish, 40 lb.	4.50 to 4.75
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	5.25 to 5.50
Envp. Mla., Sub. 16-28 (No. 2)	5.00 to 5.25
Envp. Mla. (Prices based on large sheets untrim'd rear-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	5.25 to 5.50
No. 2	5.00 to 5.25
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-25 lb.	6.00 to 6.12½
Grade B-25 lb.	5.50 to 5.62½